A REVISION OF THE WORLD SPECIES OF THE GENUS *ENDOTRICHA* ZELLER (LEPIDOPTERA : PYRALIDAE)

By PAUL E. S. WHALLEY

CONTENTS

SYNOPSIS

The genus *Endotricha* Zeller (Lepid., Pyralidae) is redefined and its systematic position is discussed. A key to the males is given. Of the 151 species previously included in the genus, 67 are retained, 42 are synonymised, two species cannot be recognised from their descriptions, 40 are placed in other genera and 24 new species are described. An account of the distribution and affinites of the species is given.

INTRODUCTION

The genus *Endotricha* was erected by Zeller (1847 : 593) for the common European species, *Pyralis flammealis* Schiffermüller. Subsequently many new species were described in it and other species transferred to it. Ragonot (1891 : 511) made it the type of a new subfamily, Endotrichiinae, which has now been reduced to a tribe of the Pyralinae (Whalley, 1961 : 733). Hampson (1896*b*) revised the whole genus ; Shibuya (1928) revised the Formosan species and Inoue (1955) catalogued the Japanese species, but neither of the last two works were based on examination of the types.

There has been confusion about the identity of particular species as well as doubt as to which species belonged in *Endotricha*. A definition of the genus based on the type species has been formulated (page 399). This produces a uniform genus which is distinguished from related ones primarily by certain diagnostic characters in the male genitalia.

Ten types were not available for study. In a few cases where the identity of species is based on syntypes, this is stated in the text. In all other cases the identity of species has been established by examination of the type. A key to the males of the genus *Endotricha* is given (page 403) and terms used in the key are defined (page 403).

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Plate 11 was drawn by Mr. A. Smith. All the remaining drawings were made by Mr. M. Shaffer, who also assisted in sorting large quantities of accessions.

DEFINITION OF THE TRIBE ENDOTRICHINI (ENDOTRICHIINAE, *PARTIM*, *AUCT.*)

This tribe is part of the subfamily Pyralinae. Proboscis well developed. Maxillary palps present. Forewing with R_5 stalked with R_4 and R_3 (Pl. 12, fig. 156). Hindwing with the median vein non-pectinate, *Rs* anastomosing with *Sc* plus R_1. Chaetosema present. (Whalley, 1961 : 733).

ENDOTRICHA ZELLER, ITS SYNONYMY AND DEFINITION

Endotricha Zeller, 1847 : 593

Herrich-Shäffer, 1848 : 12. Guenée, 1854 : 218. Walker, 1859, 17 : 338. Lederer, 1863 : 344. Meyrick, 1884 : 77 and 283 ; *id.*, 1890 : 471. Ragonot, 1891 : 522. Hampson, 1896*a* : 132 ; *id.*, 1896*b* : 481. Shibuya, 1928 : 17. Inoue, 1955 : 146.

The following genera are synonyms of *Endotricha* Zeller :

Doththa Walker, 1859, 17 : 285, (*mesenterialis* Walker, by monotypy).
Messatis Walker, 1859, 19 : 918, (*sabirusalis* Walker, by monotypy).
Pacoria Walker, 1865, 34 : 1255, (*albifimbrialis* Walker). This species has been used by Hampson in the genus *Pacoria*, but a type for this genus has never been designated. I designate *albifimbrialis* Walker as the type species of *Pacoria* Walker.
Zania Walker, 1865, 34 : 1256, (*unicalis* Walker, by monotypy).
Tricomia Walker, 1865, 34 : 1259, (*auroralis* Walker, by monotypy).
Rhisina Walker, 1865, 34 : 1324, (*puncticostalis* Walker, by monotypy).
Endotrichodes Ragonot, 1891 : 521, (*perustalis* Ragonot, by monotypy).
Endotrichopsis Warren, 1895 : 467, (*rhodopteralis* Warren, by original designation).

Tegulae in male long and prominent. Male genitalia with a conspicuous sacculus process (Pl. 13, fig. 157) always present, free or partially fused to valve. Overall plan of male genitalia as in Pl. 13, fig. 157. Gnathus a simple flat plate articulating with the uncus by means of the " gnathus arms ". The gnathus may be reduced or absent, but the gnathus arms are always present. Uncus as in Pl. 13, fig. 157 with only slight variation in shape. Female genitalia with long ovipositor, extrusible on four slender apodemes. Duct of bursa variously modified. Bursa with at least one signum (except in *E. puncticostalis* Walk.). The bursa may also have one or more patches of spines, in some cases they form a second signum.

Type species of the genus, *E. flammealis* Schiffermüller (by monotypy). As defined above, many of the species formerly placed in the genus are now removed from it. The new definition limits the genus to species with a very constant plan in the male and female genitalia.

AFFINITIES WITH OTHER GENERA IN THE ENDOTRICHINI

The genus most closely related to *Endotricha* is *Oeogenes* Meyrick, with type *O. fugalis* Felder which has a male genitalic structure almost identical with *Endotricha*, but lacks the gnathus and gnathus arms. The nearest approach to this form in *Endotricha* is in the species where the gnathus is reduced or absent, but in these the gnathus arms are always present. The female genitalia of the two genera are similar.

The lack of the gnathus and gnathus arms is sufficient to place *O. fugalis* in a separate genus. Many of the genera in the old subfamily Endotrichiinae have been moved to other subfamilies (Whalley, 1961 : 733). The true Endotrichini, which come within the definition on page 398, all show a similar genitalic pattern to *Endotricha flammealis* Schiff., and some are very similar externally.

Biology

Hardly anything is known of the biology of *Endotricha*. Buckler (1882 : 149 ; *id.* 1901 : 57) has recorded the life history of the common European species, *E. flammealis* Schiff., which feeds on flowers and leaves of *Lotus* sp., *Salix* sp. and other shrubs. The food plants of the other species in the genus have not been published.

GEOGRAPHICAL DISTRIBUTION

Endotricha is an Old World genus. Apart from North and South America and Hawaii, species occur in all other continents and most islands. The Australasian-Pacific region is the richest in species and may have been the centre of origin of the genus. Species of *Endotricha* occur in Tahiti and the Austral Islands, in Fiji and Samoa, the Marianas and Caroline Islands, the Philippines and the island chain from Australia to Malaya. I have not seen specimens from the Marshall Islands although species of the genus probably occur there also.

Many Pacific and Oriental species show a high degree of speciation on islands and mountain ranges which suggests that geographic isolation plays an important part in the speciation of this group. This is particularly apparent in three species forming the *rhodomicta* species group, *E. rhodomicta*, *E. aureorufa*, and *E. munroei*, which

are similar externally (Pl. 7, figs. 92, 93, 95 and 97) and have similar genitalia but appear to have differentiated on different mountain ranges in New Guinea. I prefer to regard them as members of a superspecies complex rather than subspecies of one species. The production of distinct species on islands is shown by the *simplex* species group where two species of *Endotricha*, very distinct in external appearance, have arisen in the Moluccas.

The Palaearctic species, *E. flammealis*, is unusual for the apparent lack of geographical subspeciation, although widespread over the whole region. It is very variable in colour but the individual variants are found over the whole range.

The small island of São Thomé off the coast of West Africa contains four endemic and very distinct species with a genitalic pattern which suggests that they were derived from the widespread African species, *E. erythralis*. This species, although variable to some extent, has not differentiated very much over the whole of the Ethiopian region. There is no apparent seasonal variation in the São Thomé material and it seems probable, since the genitalia are identical, that the four species are in fact ecologically separated in some way.

The *mesenterialis* species group contains some very widespread species and others with a restricted distribution. *E. mesenterialis* occurs from India to Australia with relatively small differences between specimens at the extremes of the range.

In Samoa, the New Hebrides and Loyalty Islands there have arisen two distinct species (*E. plinthopa* and *E. propinqua*), which show distinct signs of affinity with the parent species (*E. mesenterialis*) in such morphological characters as antennal processes and the flattening of the crown of the head. Anatomically, the genitalia conform to the same pattern which characterises this group, but externally the species are distinct (Pl. 5, figs. 61–68).

The nominate subspecies of *E. mesenterialis* occurs in the New Hebrides alongside *E. propinqua* and, in Samoa, *E. mesenterialis obscura* occurs with *E. plinthopa*. Although some similarities exist between *E. plinthopa* and *E. propinqua*, I think that they both arose independently from *E. mesenterialis*. It would appear that both the New Hebrides and Samoa were subject to at least two " invasions " of *E. mesenterialis*. After the first invasion the population was sufficiently differentiated, or ecologically separated, by the time the second invasion took place not to breed with the newcomers.

E. sexpunctata and *E. mariana* from the Marianas Is. are separated from their nearest relative by over one thousand miles. However, while the male genitalia of both species are very similar to *E. mesenterialis*, their external appearance is unlike that of any other known species of *Endotricha*.

The subspecies *E. mesenterialis mahensis* from the Seychelles is distinct externally from the mainland subspecies, but the genitalia are similar. The other subspecies, *E. mesenterialis obscura*, is not so clearly differentiated, but is generally larger and with the colour pattern more clearly defined. The genitalia are constant and similar to those of the nominate subspecies of which it represents the southern part of the range from the Orient.

The species of the *costaemaculalis* species group all have the same type of " T "-shaped uncus. *E. costaemaculalis* can best be regarded as a superspecies. The

Palaearctic specimens differ distinctly on external characters from the North Indian. There is, however, a gradation of these characters through Tibet and China. There is a second North Indian species, *E. eximia*, which is very similar to *E. costaemaculalis* in general appearance but differs in some details. In order to clarify the situation, since *E. eximia* occurs in the same area as *E. costaemaculalis fuscifusalis*, it is described as a new species rather than a subspecies of *E. costaemaculalis*.

In the following section the distribution of each species is summarised. Details of the known distribution will be found under " Material examined " for each species. In most cases previous accounts of the distribution are unreliable because of doubtful identification. Intensive collecting in limited areas (e.g., Assam, Khasi Hills) gives a somewhat one-sided impression of the distribution of the species in this genus.

The regions used are modified from Sclater (1858, *J. Linn. Soc. Lond.*, 2 : 130) as given by de Beaufort, 1951, p. 9 (*Zoogeography of the Land and Inland Waters*, Sidgewick Jackson Ltd., London).

Ethiopian Region

Continental Africa

centripunctalis (p. 445) ; *consobrinalis consobrinalis* (p. 417) ; *ellisoni* (p. 418) ; *erythralis* (p. 421) ; *niveifimbrialis* (p. 418) ; *rosina* (p. 419) ; *vinolentalis* (p. 419).

Madagascar

consobrinalis meloui (p. 417) ; *erythralis* (p. 421).

Socotra

erythralis (p. 421).

São Thomé

altitudinalis (p. 420) ; *tamsi* (p. 419) ; *thomealis* (p. 420) ; *viettealis* (p. 420).

Palaearctic Subregion

consobrinalis consobrinalis (p. 417) ; *consocia* (p. 410) ; *costaemaculalis costaemaculalis* (p. 427) ; *costaemaculalis fuscifusalis* (p. 427) ; *flammealis* (p. 409) ; *flavofascialis flavofascialis* (p. 413) ; *flavofascialis affinialis* (p. 413) ; *hœnei* (p. 430) ; *icelusalis* (p. 413) ; *kuznetzovi* (p. 412) ; *luteobasalis* (p. 434) ; *olivacealis* (p. 422) ; *portialis* (p. 421) ; *punicea* (p. 414) ; *ragonoti* (p. 409) ; *rogenhoferi* (p. 417) ; *similata* (p. 426) ; *theonalis* (p. 410).

Oriental Region

Indian subcontinent ; India, Pakistan, Afghanistan, Nepal, Goa, Bhutan, Assam ; Ceylon and the Seychelles.

albicilia (p. 437) ; *ardentalis* (p. 426) ; *costaemaculalis fuscifusalis* (p. 427) ; *decessalis decessalis* (p. 410) ; *eximia* (p. 428) ; *fuscobasalis* (p. 428) ; *loricata* (p. 415) ; *luteogrisalis* (p. 414) ; *melanobasis* (p. 429) ; *mesenterialis mesenterialis* (p. 423) ; *mesenterialis mahensis* (p. 423) ; *nigromaculata* (p. 429) ; *olivacealis* (p. 422) ; *ragonoti* (p. 409) ; *rufofimbrialis* (p. 434) ; *ruminalis* (p. 415) ; *similata* (p. 426).

Burma, Malaya, Nicobar Islands, Andaman Islands

albicilia (p. 437) ; *borneoensis* (p. 431) ; *decessalis decessalis* (p. 411) ; *decessalis major* (p. 411) ; *flavifusalis* (p. 434) ; *mesenterialis mesenterialis* (p. 423) ; *nicobaralis* (p. 441) ; *olivacealis* (p. 422) ; *ruminalis* (p. 415) ; *semirubrica* (p. 435) ; *similata* (p. 426) ; *trichophoralis* (p. 414).

Borneo—including Sarawak and Pulo Laut—Java and Sumatra

affinitalis (p. 415) ; *approximalis* (p. 440) ; *borneoensis* (p. 431) ; *decessalis major* (p. 411) ; *denticostalis* (p. 436) ; *flavifusalis* (p. 434) ; *mesenterialis mesenterialis* (p. 423) ; *olivacealis* (p. 422) ; *portialis* (p. 421) ; *rufofimbrialis* (p. 434) ; *sandaraca* (p. 435) ; *semirubrica* (p. 435) ; *suavalis* (p. 426) ; *trichophoralis* (p. 414).

Formosa

consocia (p. 410) ; *costaemaculalis formosensis* (p. 427) ; *metacuralis* (p. 430) ; *olivacealis* (p. 422) ; *portialis* (p. 421) ; *ruminalis* (p. 415) ; *theonalis* (p. 410).

Philippines

wilemani (p. 416) ; *approximalis* (p. 440).

Australasian-Pacific Region

Australia, including one species recorded from New Zealand, marked " * "

approximalis (p. 440) ; *chionocosma* (p. 437) ; *dispergens* (p. 440) ; *euphiles* (p. 432) ; *hemicausta* (p. 411) ; *ignealis* (p. 422) ; *lobibasalis* (p. 442) ; *melanochroa* (p. 412) ; *mesenterialis obscura* (p. 424) ; *occidentalis* (p. 411) ; *psammitis* (p. 441) ; *puncticostalis* (p. 416) ; *pyrosalis** (p. 440) ; *pyrrhocosma* (p. 444).

New Guinea, Dampier I., Louisiade Archipelago, Moluccas, Bismarck Archipelago, Bali

approximalis (p. 440) ; *aureorufa* (p. 433) ; *borneoensis* (p. 431) ; *chionosema* (p. 442) ; *conchylaria* (p. 436) ; *coreacealis* (p. 441) ; *cruenta* (p. 438) ; *encaustalis* (p. 440) ; *faceta* (p. 431) ; *fastigia* (p. 429) ; *flavifusalis* (p. 434) ; *fuliginosa* (p. 437) ; *gregalis* (p. 421) ; *lobibasalis* (p. 442) ; *melanochroa* (p. 412) ; *mesenterialis mesenterialis* (p. 423) ; *mesenterialis obscura* (p. 424) ; *munroei* (p. 433) ; *murecinalis* (p. 421) ; *persicopa persicopa* (p. 432) ; *persicopa paliolata* (p. 432) ; *pyrrhaema* (p. 443) ; *pyrrhocosma* (p. 444) ; *thermidora* (p. 444) ; *rhodomicta*(p. 432) ; *simplex simplex* (p. 439) ; *simplex rosselli* (p. 439) ; *variabilis* (p. 439).

Solomon Is., New Hebrides, Loyalty Is., Fiji, Tonga, Samoa, New Caledonia, Kermadec Is., Norfolk I., Tahiti, Marianas Is., Caroline Is.

approximalis (p. 440) ; *argentata* (p. 425) ; *borneoensis* (p. 431) ; *bradleyi* (p. 444) ; *capnospila* (p. 437) ; *dyschroa* (p. 442) ; *luteopuncta* (p. 442) ; *mariana* (p. 444) ; *mesenterialis mesenterialis* (p. 423) ; *mesenterialis obscura* (p. 424) ; *peterella* (p. 443) ; *plinthopa* (p. 424) ; *propinqua* (p. 424) ; *thermidora* (p. 444) ; *separata* (p. 445) ; *sexpunctata* (p. 425) ; *wammeralis* (p. 445).

DEFINITION OF TERMS USED

Basal process of valve.—A digitate process at the base of the valve (Pl. 13, fig. 157).

Bursa.—Includes ductus bursa and bursa copulatrix.

Chaetosema.—Small pad with hair-like scales on dorsal side of head, one chaetosema posterior to each eye.

Coremata. Large scale tufts on the last segment of the abdomen of the male.

Cornutus (*-i*). Spine or spines on vesica inside the aedeagus, only clearly seen when vesica has been everted.

Costal hairs (usually used as the term "*reflexed costal hairs*"). Pl. 13, fig. 157. These are modifications of from two to six scales on the costal margin of the valve in the male genitalia. In some specimens the hairs may be broken off but the enlarged socket where they were attached is always visible. Fine reflexed hairs are often present on the costa of the valve but they are lightly attached to the valve and their sockets are minute. These fine hairs are usually removed in the ordinary course of making a microscope mount.

Gnathus. Pl. 13, fig 157.

Gnathus arms. Pl. 13, fig. 157.

Juxta. Pl. 13, fig. 157.

Patagia. Collar of scales immediately posterior to the head.

Sacculus process. Pl. 13, fig. 157. Large, spine-like process at ventral margin of valve which may be variously modified.

Signum. A definite patch of spines, usually circular or oval, on the bursa of the female.

Socii. Pl. 13, fig. 157.

Subscaphium. A sclerotised portion of the ventral part of the anal tube.

Tegulae. Long, backward projecting scale-tufts on the tegular plates.

Uncus. Pl. 13, Fig. 157.

Uncus process. Pl. 13, fig. 157. This may be absent, but, when present, it is always paired and may take the form of a single pair of spines, several small spines or two raised papillae covered with spines.

Wing "x mm.". Mean wing measurement taken from apex of forewing to centre of mesothorax.

Wingspan. Largest possible total expanse of both forewings.

KEY TO THE MALES OF THE GENUS

The definition of terms used in this key are given above. The following species are known from the female only and are thus not included in the key: *affinitalis* Hering, *ardentalis* Hampson, *chionocosma* Turner, *sondaicalis* Snellen, *wilemani* West.

1		Costa strongly concave, apex of wing very pointed, as in Pl. 7, fig. 91 ***fastigia*** (p. 429)
—		Costa not as strongly concave as Pl. 7, fig. 91 2
2	(1)	Underside of forewing with oval white patch of scales in anal area. Hindwing with a large white patch over cell . . . . . ***chionosema*** (p. 442)
—		No oval white patch in anal area of fore wing. No white over cell in hindwing 3

3 (2) Labial palps extending well above vertex of head (Pl. 11, fig. 153) . ***portialis*** (p. 421)
— Labial palps not extending above vertex of head 4

4 (3) Costal margin of forewing with basal part enlarged . . ***lobibasalis*** (p. 442)
— Basal part of costal margin of forewing not enlarged 5

5 (4) Basal part of costa of forewing with strongly modified scale-tuft projecting beyond costa, outer part of costa unmodified . . . ***trichophoralis*** (p. 414)
— Basal part of costa of forewing unmodified, without scale-tufts or entire costal margin toothed 6

6 (5) Costal margin of forewing with scales modified along the edge giving a strongly toothed appearance to costa . . . . . ***denticostalis*** (p. 436)
— Costa of forewing not toothed 7

7 (6) Apex of forewing distinctly truncate (Pl. 9, fig. 123) . . ***dispergens*** (p. 440)
— Apex of forewing not distinctly truncate 8

8 (7) Large, black, sharply defined, rectangular patch in posterior part of basal area of forewing (Pl. 6, fig. 84) . . . . . ***nigromaculata*** (p. 429)
— No black rectangular patch in basal area of forewing 9

9 (8) Large black patch in cell on underside of forewing. Long, yellow, hair-like scales in anal area on underside of forewing . . . ***fuliginosa*** (p. 437)
— Forewing without black patch or modified scales 10

10 (9) Black, oval patch covering base of veins Cu_{1a} and M_3 in upper side of hindwing . . . . . ***capnospila*** (p. 437)
— Hindwings without black basal patch 11

11 (10) Large yellow spot in forewing between veins $1A$ and Cu_{1b} . ***luteopuncta*** (p. 442)
— No yellow spot between veins $1A$ and Cu_{1b} 12

12 (11) Yellow spot in forewing at apex of cell . . . . ***kuznetzovi*** (p. 412)
— Forewing without yellow spot at apex of cell 13

13 (12) Basal process on valve of male genitalia prominent 14
— No basal process on valve 22

14 (13) No reflexed hairs on costal margin of valve 15
— Reflexed hairs present 16

15 (14) Uncus process a group of spines on each side. Juxta with central keel. Basal process long, curved (Pl. 20, fig. 199) . . . . ***melanobasis*** (p. 429)
— Uncus process one spine on each side (Pl. 19, fig. 191). Juxta simple, basal process not curved . . . . . ***olivacealis*** (p. 422)

16 (14) Silvery-grey species. Sacculus process truncate (Pl. 18, fig. 189) ***argentata*** (p. 425)
— Otherwise coloured. Sacculus process pointed or truncate 17

17 (16) Two large hyaline areas on each forewing, large oval hyaline area on each hindwing. Sacculus process truncate (Pl. 18, fig. 188) . . ***sexpunctata*** (p. 425)
— Otherwise coloured. Sacculus process truncate or pointed 18

18 (17) Juxta pitted all over 19
— Juxta smooth except for a few spines in the centre of the posterior margin . 20

19 (18) Dark reddish species with prominant median white area. Sacculus as in Pl. 19, fig. 195 . . . . . ***propinqua*** (p. 424)
— Pale coloured species. Median white area not sharply defined. Sacculus process as in Pl. 19, fig. 192 . . . . . ***plinthopa*** (p. 424)

20 (18) Wing span 18·5 mm. or over . . . . ***mesenterialis obscura*** (p. 424)
— Wing span less than 18·5 mm. 21

21 (20) Fore- and hindwings with white, clearly defined median area
mesenterialis mahensis (p. 423)
— Fore- and hindwings with median area yellowish, not sharply defined
mesenterialis mesenterialis (p. 423)

22 (13) Reflexed hairs present on costal margin of valve 23
— Reflexed hairs absent 52

23 (22) Sacculus process simple 29
— Sacculus process enlarged (Pl. 27, figs. 238–242) or truncate (Pl. 23, fig. 217) . 24

24 (23) Sacculus process truncate (Pl. 23, fig. 217). Cornutus as in Pl. 23, fig. 217
conchylaria (p. 436)
— Sacculus process not truncate. Cornutus not as in Pl. 23, fig. 217 . . . 25

25 (24) Forewings with conspicuous, white, zig-zag, post-median fascia. General colour of forewings dark brown and black with prominent white median area. Cornutus as in Pl. 28, fig. 246 . . . . . ***mariana*** (p. 444)
— Forewing colour not as above. Cornutus not as in Pl. 28, fig. 246 . . 26

26 (25) Basal and median area of forewings reddish purple. Rest of forewings and hindwings almost unmarked, dirty white. Cornutus as in Pl. 28, fig. 247
bradleyi (p. 444)
— Forewings otherwise coloured 27

27 (26) Basal area of hindwings deep chestnut red. Median area of hindwing whitish. Cornutus as in Pl. 28, fig. 245 . . . . . ***pyrrhocosma*** (p. 444)
— Hindwings otherwise coloured 28

28 (27) General colour reddish brown. Median area not conspicuously demarcated. Large species, over 14 mm. wingspan. Cornutus as in Pl. 28, fig. 243
thermidora (p. 444)
— Smaller species, under 14 mm. wingspan. Hindwing with broad yellow median area, narrowing posteriorly. Cornutus as in Pl. 28, fig. 244 . ***separata*** (p. 445)

29 (23) Underside of forewings with conspicuous brown scales over base of veins Cu_{1b} and Cu_{1a} . . . . . ***coreacealis*** (p. 441)
— No brown scales as above 30

30 (29) Underside of forewing with purplish patch along costal margin, demarcated by the veins . . . . . ***pyrosalis*** (p. 440)
— Not as above 31

31 (30) Cornutus very long and spiny (Pl. 25, fig. 231 and Pl. 26, fig. 237) . . . 32
— Cornutus not long and spiny 33

32 (31) Pinky red species. Gnathus apparently absent. Genitalia as in Pl. 26, fig. 237
pyrrhaema (p. 443)
— Grey brown species. Gnathus present. Genitalia as in Pl. 25, fig. 231 ***peterella*** (p. 443)

33 (31) Manica of aedeagus with prominent spines. Genitalia as in Pl. 24, fig. 225
encaustalis (p. 440)
— No prominent spines on manica 34

34 (33) Uncus process present 35
— Uncus process absent 38

35 (34) Genitalia as in Pl. 26, fig. 235 . . . . . ***approximalis*** (p. 440)
— Genitalia not as in Pl. 26, fig. 235 36

36 (35) Wingspan 20 mm. or over . . . . . ***albicilia*** (p. 437)
— Wingspan less than 20 mm. 37

37 (36) Sacculus process short. Uncus processes widely separate. Gnathus blunt (Pl. 18, fig. 187) . . . . . ***rogenhoferi*** (p. 417)
— Sacculus process long. Uncus process joined in mid-line. Gnathus pointed (Pl. 26, fig. 234) . . . . . ***nicobaralis*** (p. 441)

38 (34) Base of sacculus very spiny (Pl. 18, fig. 184) . . ***niveifimbrialis*** (p. 418)
— Base of sacculus not spiny 39

39 (38) Aedeagus with cornutus consisting of 5 or 6 spines. Forewing with R_3 arising before R_5 on common stem of R_{3+4+5} . . . . . ***ignealis*** (p. 422)
— Cornutus not as above. R_3 arising after R_5 on common stem of R_{3+4+5} . 40

40 (39) Cornutus minute, vesica covered with small spines. Sacculus process upturned (Pl. 16, fig. 175) . . . . . ***vinolentalis*** (p. 419)
— Cornutus large. Sacculus process straight or upturned 41

41 (40) Specimens from Ethiopian or Madagascan Region 42
— Specimens from other zoogeographical regions 46

42 (41) Cornutus rounded, short. General colour of wings purplish-red ***erythralis*** (p. 421)
— Cornutus slightly hooked. (Pl. 17, fig. 176). Wings variously coloured . 43

43 (42) Prominent zig-zag fascia across forewing 44
— No zig-zag fascia across forewing 45

44 (43) General colour of forewing brown . . . . . ***altitudinalis*** (p. 420)
— Forewings olive-green . . . . . ***thomealis*** (p. 420)

45 (43) Forewings chololate brown. Prominent white patch near inner edge of hind margin of forewing . . . . . ***tamsi*** (p. 419)
— Forewings pale pinky-red with thin, almost obscure, white median fascia ***viettealis*** (p. 420)

46 (41) Cornutus hooked, genitalia as in Pl. 17, fig. 178 . . . ***murecinalis*** (p. 421)
— Cornutus not hooked 47

47 (46) Underside of hindwing with black ante- and post-median fascia, very conspicuous. Wingspan 28–30 mm. . . . . ***variabilis*** (p. 439)
— Otherwise coloured 48

48 (47) Sacculus process strongly upturned (Pl. 17, fig. 179). General colour of forewings grey . . . . . ***gregalis*** (p. 421)
— Sacculus process straight or only slightly upturned. Forewings not grey . 49

49 (48) Circular patch of yellow or white scales in anal area on underside of forewing ***simplex rosselli*** (p. 439)
— Not as above 50

50 (49) Bright red and yellow species. Wingspan under 20 mm. . . ***cruenta*** (p. 438)
— Not as above. Wingspan over 20 mm. 51

51 (50) Wingspan over 25 mm. Genitalia as in Pl. 24, fig. 220 . . ***simplex*** (p. 439)
— Wingspan less than 25 mm. Genitalia as in Pl. 25, fig. 228 . . ***dyschroa*** (p. 442)

52 (22) Uncus process present 53
— Uncus process absent 80

53 (52) Basal process present . . . . . ***melanobasis*** (p. 429)
— No basal process 54

54 (53) Uncus process simple on each side or uncus process absent 55
— Uncus process a group of spines on each side 61

55 (54) Cornutus bifurcate, Y-shaped. Manica with strong spines 56
— Cornutus not Y-shaped, or cornutus absent 57

56 (55) Forewings dark. Thin, indistinct yellow median fascia ***flavofascialis affinialis*** (p. 413)
— Forewings reddish with broad median yellow fascia ***flavofascialis flavofascialis*** (p. 413)

57 (55) Uncus " T "-shaped. Sacculus process strongly reflexed (Pl. 23, fig. 215) ***semirubrica*** (p. 435)
— Uncus not " T "-shaped. Sacculus process not reflexed 58

58 (57) Cornutus large and conspicuous 59
— Cornutus small or absent 60

59 (58) Sacculus process wavy, prominent crosspiece (Pl. 26, fig. 236) ***psammitis*** (p. 441)
— Sacculus process straight, upturned at end, no crosspiece . ***decessalis*** (p. 410)

60 (58) Broad yellow median area in hindwing. Sacculus process straight. Valve outline wavy (Pl. 15, fig. 168) . . . . . ***icelusalis*** (p. 413)
— Median area of hindwing narrow. Sacculus process with small projection at end. Valve outline not wavy (Pl. 16, fig. 172) . . . . . ***loricata*** (p. 415)

61 (54) Juxta with a prominent pair of spiny apical processes (Pl. 19, fig. 193) ***fuscobasalis*** (p. 428)
— No spiny processes at apex of juxta 62

62 (61) Sacculus with two pairs of arms (Pl. 20, fig. 201) . . . ***borneoensis*** (p. 431)
— Sacculus process simple 63

63 (62) Sacculus process truncate. Genitalia as in Pl. 20, fig. 200 . . ***faceta*** (p. 431)
— Sacculus process not truncate. Process either straight or recurved . . 64

64 (63) Sacculus process straight or wavy, end of process straight or slightly upturned, never recurved 71
— Sacculus process strongly recurved on itself 65

65 (64) Dark coloured species never pinky red and yellow. Socii pointed. Genitalia as in Pl. 20, fig. 197 . . . . . ***similata*** (p. 426)
— Otherwise coloured. Socii not pointed. Genitalia different from Pl. 20, fig. 197 66

66 (65) Hindwings with reddish purple patch covering, at least, terminal area enclosed by *Sc* to M_1 67
— No reddish purple in this position on hindwing, most of hindwing yellow with reddish median fascia 69

67 (66) Reddish purple fascia covering terminal part of all hindwing veins except $3A$ 68
— Reddish purple terminal fascia of hindwing ending at M_3, occasionally reaching Cu_{1a} . . . . . ***persicopa persicopa*** (p. 432)

68 (67) Uncus " T "-shaped (Pl. 21, fig. 205) . . . . . ***euphiles*** (p. 432)
— Uncus not " T "-shaped (Pl. 21, fig. 207) . . . ***persicopa paliolata*** (p. 432)

69 (66) Juxta without any keels (Pl. 22, fig. 210) . . . . . ***munroei*** (p. 433)
— Juxta with keels (Pl. 22, figs. 208 and 209) 70

70 (69) Juxta with one median keel (Pl. 22, fig. 209) . . . ***aureorufa*** (p. 433)
— Juxta with two lateral keels (Pl. 22, fig. 208) . . . ***rhodomicta*** (p. 432)

71 (64) Juxta strongly constricted (Pl. 19, fig. 194) . . . . . ***hœnei*** (p. 430)
— Juxta simple, no constriction 72

72 (71) Uncus not " T "-shaped. Sacculus process upturned, ending in a fine point (Pl. 21, fig. 204) . . . . . ***metacuralis*** (p. 430)
— Uncus " T "-shaped 73

73 (72) Aedeagus with two cornuti. Genitalia as in Pl. 22, fig. 213 . ***sandaraca*** (p. 435)
— Genitalia not as in Pl. 22, fig. 213 74

74 (73) Pinky red and yellow species 75
— Otherwise coloured 76

75 (74) Uncus process as in Pl. 23, fig. 214. No cornutus . . ***flavifusalis*** (p. 434)
— Uncus process as in Pl. 22, fig. 211. Cornutus present . ***rufofimbrialis*** (p. 434)

76 (74) Large species, wingspan over 20 mm. Broad, white, median fascia in fore, and hind wings. Genitalia as in Pl. 20, fig. 198 . . . . ***suavalis*** (p. 426)
— Not as above 77

77 (76) Hindwings whitish. Cornutus a row of spines, Pl. 21, fig. 202 . ***eximia*** (p. 428)
— Not as above 78

78 (77) Gnathus truncate, Pl. 22, fig. 212. Genitalia as in Pl. 22, fig 212 ***luteobasalis*** (p. 434)
— Gnathus pointed, Pl. 20, fig. 196. Genitalia as in Pl. 20, fig. 196 . . . 79

79 (78) Forewings with narrow median white line enlarged on costal margin. General colour purplish red . . . ***costaemaculalis costaemaculalis*** (p. 427)
— Indistinct median white line on forewings. General colour blackish grey-brown ***costaemaculalis fuscifusalis*** (p. 427) and ***costaemaculalis formosensis*** (p. 427)

80 (52) Base of sacculus process enlarged and strongly spiny, Pl. 16, figs. 173, 174 . 81
— Base of sacculus process simple, no spines 82

81 (80) Base of sacculus process short and broad, process short (Pl. 16, fig. 174) ***rosina*** (p. 419)
— Base of sacculus process long and narrow, process long and upturned (Pl. 16, fig. 173) . . . . . ***ellisoni*** (p. 418)

82 (80) Sacculus process broad, truncate 83
— Sacculus process pointed, never truncate 84

83 (82) Large cornutus . . . . . ***theonalis*** (p. 410)
— No cornutus . . . . . ***punicea*** (p. 414)

84 (82) Cornutus small and inconspicuous 85
— Cornutus large and conspicuous 86

85 (84) Sacculus process short (Pl. 18, fig. 183) . . . . ***puncticostalis*** (p. 416)
— Sacculus process long and thin (Pl. 18, fig. 182) ***consobrinalis consobrinalis*** (p. 417)

86 (84) Hindwings yellow . . . . . ***hemicausta*** (p. 411)
— Hindwings not yellow 87

87 (86) Basal area of forewing black, hindwings unmarked . . ***melanochroa*** (p. 412)
— Not as above 88

88 (87) Genitalia as in Pl. 14, fig. 160 . . . . . ***consocia*** (p. 410)
— Genitalia not as in Pl. 14, fig. 160 89

89 (88) Fore- and hindwings with a distinct, clearly defined, broad median fascia . 90
— Fore- and hindwings not as above 91

90 (89) Fore- and hindwing median fascia pale lemon yellow. Oriental species ***luteogrisalis*** (p. 414)
— Fore- and hindwing fascia not pale lemon yellow, Madagascan species ***consobrinalis meloui*** (p. 417)

91 (89) Sacculus process strongly upturned (Pl. 14, fig. 163) . . ***occidentalis*** (p. 411)
— Sacculus process more or less straight 92

92 (91) Median area in hindwing white. Genitalia as in Pl. 14, fig. 159 . ***ragonoti*** (p. 409)
— Median area in hindwing not clear white 93

93 (92) Cornutus short and broad (Pl. 16, fig. 171). Intense, conspicuous black post-median line in hindwing . . . . . ***ruminalis*** (p. 415)
— Cornutus long and pointed (Pl. 14, fig. 158). Wings variable in colour from black to pale straw yellow . . . . . ***flammealis*** (p. 409)

TAXONOMIC SECTION WITH DESCRIPTIONS OF NEW SPECIES

The type locality of each species is given in brackets after the reference. All the specimens are in the British Museum (Natural History) unless otherwise stated.

The *FLAMMEALIS* Species Group

This consists of the next three species. The first two species are more closely related to one another than to the third.

1. ***Endotricha flammealis*** (Denis and Schiffermüller)

(Pl. 1, figs. 1 and 4, and Pl. 11, fig. 152)

Pyralis flammealis Denis and Schiffermüller, 1775 : 123 (Vienna District). The type of this species was destroyed with the rest of the Schiffermüller collection. (Horn and Kahle 1935–37 : 243.)

E. flammealis carnealis de Lattin, 1951 : 66 (Turkey). Type ♂ in Zoological Institute, Univ. of Saaland, Saabrucken, **syn. n.**

This is a widespread species in the Palaearctic region. The coloration of the wings is variable over the whole region. The genitalia are constant and there has been no apparent subspeciation over the whole of its range. Most of the other widely distributed species of the genus tend to form subspecies when spread over a wide area.

E. flammealis Denis and Schiff. *var. adustalis* Turati, 1905 : 48 (Sicily).

E. flammealis Denis and Schiff. *var. lutealis* Turati, 1905 : 48(Sicily).

We have the original series of both these varieties in the British Museum (ex. Ragusa coll.) The degree of variation within each series is large and I do not think that these variety names have any significance.

E. flammealis Denis and Schiff. *var. montanalis* Krulikovosky, 1907 : 32 (Caucasus). Type not traced (? in Kiev).

I have only examined a few specimens from the type locality but these do not differ from specimens from the rest of the range of *E. flammealis*.

Genitalia. ♂, Pl. 14, fig. 158. ♀, Pl. 29, fig. 252.

Material examined. England and Wales, 25 ♂, 18 ♀; Scilly Is., 1 ♂; France, 9 ♂, 8 ♀; Hungary, 28 ♂, 20 ♀; Spain, 4 ♂, 1 ♀; Portugal, 1 ♂, 2 ♀; Corsica, 4 ♂; Sardinia, 1 ♂; Germany, 5 ♂, 2 ♀; Italy, 3 ♂, 3 ♀ (in Munich Museum). Capri, 1 ♂; Cyprus, 4 ♂, 4 ♀; Turkey, 10 ♂, 8 ♀ (8 ♂, 8 ♀ in coll. de Lattin); Asia Minor, 1 ♂; Transcaucasia, 4 ♂; Crimea, 2 ♂; Lebanon, 1 ♂; Iran, 2 ♂ (in Amsel coll.); Syria, 9 ♂, 8 ♀; Algeria, 21 ♂, 17 ♀; Tunisia, 7 ♂, 5 ♀.

2. ***Endotricha ragonoti*** Christoph

(Pl. 1, fig. 7)

E. ragonoti Christoph, 1893 : 96 (Turkestan). I designate as lectotype a ♂ labelled "Tian chan" (Turkestan) in Leningrad Museum.

E. albicinctalis Hampson, 1903 : 206 (North India). Holotype ♂ in B.M. **syn. n.**

I have not seen the lectotype but have examined material from the Leningrad Museum which had been compared with it by Dr. Kuznetzov. The genitalia of these specimens agree very closely with *E. albicinctalis* from N. India.

Genitalia. ♂, Pl. 14, fig. 159. ♀, Pl. 29, fig. 253.

MATERIAL EXAMINED. CENTRAL ASIA, 5 ♂, 2 ♀ (including 2 ♂, 2 ♀ in Munich Mus.); INDIAN SUBCONTINENT (North), 1 ♂.

3. ***Endotricha consocia*** (Butler)

(Pl. 1, figs. 2 and 5)

Doththa consocia Butler, 1879 : 452. (Japan.) Holotype ♀ in B.M.
E. albicilia Hampson; Wileman *nec* Hampson, 1911 : 368.

The colour of the Japanese specimens varies from pale orange-red to a deep red-brown. Further examination of more material from widely separated localities may show that this species can be split into subspecies.

Genitalia. ♂, Pl. 14, fig. 160. ♀, Pl. 29, fig. 254.

MATERIAL EXAMINED. JAPAN, 2 ♂, 9 ♀ (including 5 ♀ in Inoue coll.); CHINA, 1 ♂, 2 ♀.

THE *THEONALIS* SPECIES GROUP

The next two species are closely related and can only be reliably separated on genitalia.

4. ***Endotricha theonalis*** (Walker)

(Pl. 1, figs. 3 and 6)

Pyralis theonalis Walker, 1859, 19 : 900. (Shanghai.) Holotype ♂ in B.M.
Pyralis thermusalis Walker, 1859, 19 : 912. (Shanghai.) Holotype ♀ in B.M.
Zania unicalis Walker, 1865, 34 : 1257. (Shanghai.) Holotype ♂ in B.M.
Endotrichodes perustalis Ragonot, 1891 : 522. (Shanghai.) Holotype ♂ in Paris Mus.
Endotricha hypogrammalis Hampson, 1906 : 209. (China.) Holotype ♂ in B.M. **syn. n.**
E. anpingia Strand, 1919 : 55. (Formosa.) Holotype ♀ in Deut. Ent. Inst., Berlin, **syn. n.**

The wing span of the Japanese specimens is larger than the Chinese ones (21 mm. for the former, 17 mm. for the latter) and there is some variation in the shape of the cornutus. Further material will probably show that the Japanese specimens represent a distinct subspecies.

Genitalia. ♂, Pl. 14, fig. 162. ♀, Pl. 29, fig. 256.

MATERIAL EXAMINED. CHINA, 6 ♂, 3 ♀; FORMOSA, 3 ♂, 3 ♀; JAPAN, 8 ♂, 1 ♀ (including 3 ♂ in Inoue coll.).

5. ***Endotricha decessalis*** Walker

This species is very variable in size and coloration. The nominate subspecies is smaller than the new subspecies from Sarawak. In contrast with *E. theonalis* this species has a pointed sacculus process on the valve of the male.

Endotricha decessalis decessalis Walker

(Pl. 1, figs. 8 and 11)

E. decessalis Walker, 1859, 17 : 390. (Ceylon.) Holotype ♀ in B.M.

The wing-span of this subspecies is 18 mm. compared with 22 mm. of the subspecies *major*.

Genitalia. ♂, Pl. 14, fig. 161. ♀, Pl. 29, fig. 255.

MATERIAL EXAMINED. CEYLON, 2 ♂, 3 ♀; BURMA, 2 ♂, 8 ♀; SEYCHELLES, 1 ♀.

Endotricha decessalis major subsp. n.

(Pl. 1, fig. 9)

♂. Wing 11 mm. Head grey, thorax grey-brown.

Forewing. Unicolorous orange-yellow irrorate with brown. Terminal area with a pinky suffusion.

Hindwing. Similar, median area yellower than margin. Margin with a pinky suffusion.

Underside. Forewings paler than upperside with smoky suffusion. Hindwings with clear ante- and post-median fascia.

♀. Darker than ♂. Median area on upperside of hindwings distinct. This subspecies is larger and a more orange yellow (instead of brown) than the nominate subspecies.

Genitalia. As nominate subspecies.

MATERIAL EXAMINED. Holotype ♂, SARAWAK, " Sarawak ", Brit. Mus. slide No. 4791, in B.M.

Paratypes. SARAWAK, 2 ♂ (data as type).

Other material. ANDAMAN IS., 2 ♀.

THE *OCCIDENTALIS* SPECIES GROUP

The next three species are Australian. They show some similarities in genitalia structure to the species in the two preceding groups. This group contains the only known Australian species which lack the reflexed costal hairs.

6. *Endotricha occidentalis* Hampson

(Pl. I, fig. 10)

E. occidentalis Hampson, 1916 : 361. (W. Australia.) Holotype ♂ in B.M.

This species is known only from the type specimen.

Genitalia. ♂, Pl. 14, fig. 163.

MATERIAL EXAMINED. AUSTRALIA, 1 ♂ (type).

7. *Endotricha hemicausta* Turner

(Pl. 1, fig. 12)

E. hemicausta Turner, 1904 : 184. (N. Australia.) Holotype ♂ in C.S.I.R.O., Canberra, Australia.

This species is known only from the type specimen.

Genitalia. ♂, Pl. 15, fig. 164.

MATERIAL EXAMINED. AUSTRALIA, 1 ♂ (in C.S.I.R.O. coll.).

8. *Endotricha melanochroa* Turner

(Pl. 1, fig. 13)

E. melanochroa Turner, 1911 : 121. (N. Australia.) Holotype ♀ in C.S.I.R.O., Canberra, Australia.

E. sareochroa Hampson, 1916 : 362. (W. Australia.) Holotype ♂ in B.M. **syn. n.**

This species is variable in colour. Specimens from W. Australia are a sandy colour whereas those from the north tend to be greyer.

Genitalia. ♂, Pl. 15, fig. 165. ♀, Pl. 29, fig. 257.

MATERIAL EXAMINED. AUSTRALIA, 2 ♂, 1 ♀ (♀ type in Canberra) ; BALI, 1 ♀.

THE *ICELUSALIS* SPECIES GROUP

The next four species have a forked cornutus in the aedeagus. The first three species are very similar externally and have often been confused. A yellow spot in the forewing separates *E. kuznetzovi* sp. n. from the other species in the group. The last species has similar genitalia to the rest of the group but is distinct externally.

9. *Endotricha kuznetzovi* sp. n.

(Pl. 2, figs. 16 and 19)

♂. Wing 8·5 mm. Head orange-brown. Thorax orange-brown with white scales scattered throughout.

Forewing. Fringe white, outer margin with thin interrupted black line along edge. Terminal area reddish brown. Two parallel slightly sinuous lines subterminally. Subterminal area reddish brown suffused with black. A bright yellow discal spot. Yellow median band edged with white, antemedial line black, incomplete anteriorly. Sub-basal and basal area brick red. Costal margin black interrupted by clear white marks.

Hindwing. No subterminal line. Median area white with yellow centre edged on outer and inner margin with black. Rest of wing red.

♀. Similar.

Genitalia. ♂, Pl. 15, fig. 166. ♀, Pl. 29, fig. 258.

MATERIAL EXAMINED. Holotype ♂, MANCHURIA, " Manchuria ", Brit. Mus. slide No. 4852, in B.M.

Paratypes. MANCHURIA, 2 ♂, " Sidemi, (Jackowski), 1882 " ; 4 ♂, " Moerschan, 100 km. (Charbin) " ; 1 ♂, " Hsioling Prov. (Kirin), 6.viii.39 " ; 1 ♂, " Yablonga, 23.vii.37 ", (all in Munich Museum) ; 2 ♂, (ex Paravicini coll).

EAST SIBERIA, 1 ♂, 1 ♀, " Amur, coll. Kalchberg ", (in Nat. Hist. Mus., Vienna) ; 2 ♂, 2 ♀, " Narva, S. Ussuri " ; 1 ♂, 1 ♀, " Amur " ; 1 ♂, " Ussuri, Chabarovosk, 1910, (Borsow) " ; 3 ♂, 2 ♀, " Askold ".

KOREA, 1 ♂, " Ori Dong, iv.53, (Thompson) " ; 1 ♂, 1 ♀, " Gensan, 1887, (Leech) ".

Other material. JAPAN, 2 ♂, 1 ♀, " Chigasaki, 23.viii.56, (Inoue) ", (in coll. Inoue).

It is possible that the Japanese specimens represent a new subspecies. The number of " arms " of the cornutus is larger than in any other specimens examined. This species is related to *E. flavofascialis* Bremer.

10. ***Endotricha flavofascialis*** (Bremer)

The hooked sacculus process of the male of this species separates it from all other species in this group.

Endotricha flavofascialis flavofascialis (Bremer)

Rhodaria flavofascialis Bremer, 1864 : 65. (East Siberia.) Holotype ♀ in Leningrad Museum.
E. icelusalis Walker ; Hampson *nec* Walker, 1896*b* : 484.

The moth is not figured, all the specimens examined were too poor to photograph. This subspecies differs from subspecies *affinialis* (Pl. 2, fig. 24) in the presence of a clearly defined yellow band in the forewing of the nominate subspecies.

Genitalia. ♂, Pl. 15, fig. 167. ♀, Pl. 30, fig. 259.

MATERIAL EXAMINED. EAST SIBERIA, 2 ♂, 1 ♀.

Endotricha flavofascialis affinialis South. **stat. n.**

(Pl. 2, fig. 24)

E. affinialis South, 1901 : 418. (Japan.) Holotype ♂ in B.M.
Scenedra affinialis South ; Inoue, 1955 : 147.

The median area of the forewing which is clearly defined in the nominate subspecies has almost disappeared in this subspecies. There is also a slight difference in the shape of the valve process which is more strongly upturned than in the nominate subspecies.

Genitalia. As nominate subspecies.

MATERIAL EXAMINED. JAPAN, 4 ♂.

11. ***Endotricha icelusalis*** (Walker)

(Pl. 2, figs. 17 and 20)

Pyralis icelusalis Walker, 1859, 19 : 900. (North China.) Holotype ♀ in B.M.
Pyralis rosealis Walker, 1865, 34 : 1236. (North China.) Holotype ♂ in B.M.
Endotricha icelusalis Walker form *rosealis* Walker, *auct.*
E. icalusalis Walker ; Caradja and Meyrick, 1936 : 149 (mis-spelling).
E. icelusalis var *rosealis* Walker ; Caradja, 1932 : 121.

There is considerable variation in the brick-red ground colour of this species. This species varies in size and is generally larger than *E. flavofascialis* which it

externally resembles, (*icelusalis*, wing, 9 mm. ; *flavofascialis*, wing, 8 mm.). The lack of the yellow discal spot separates this species from *kuznetzovi* and the straight subterminal line on the forewing separates it from *flavofascialis*.

Genitalia. ♂, Pl. 15, fig. 168. ♀, Pl. 30, fig. 260. Curious pores are visible in the bursa copulatrix near the signum in the female. I have not seen them in any other species, their position does not appear to be constant.

MATERIAL EXAMINED. CHINA, 5 ♂, 11 ♀; JAPAN, 5 ♂, 3 ♀ (including 1 ♂ in Canadian National coll.).

12. ***Endotricha trichophoralis*** Hampson

(Pl. 1, fig. 14)

E. trichophoralis Hampson, 1906 : 209. (Singapore.) Holotype ♂ in B.M.

This species is only known from the damaged type and a single female specimen, which lacks an abdomen.

Genitalia. ♂, Pl. 15, fig. 169.

MATERIAL EXAMINED. MALAYA, 1 ♂ ; BORNEO, 1 ♀.

THE *LUTEOGRISALIS* SPECIES GROUP

The next nine species show some features in common, particularly the tendency for a reduction in the size of the cornutus in the aedeagus, which may even be absent. There is also a general similarity in pattern between the species in this group. The group is not a natural one, the similarities probably being due to convergence.

13. ***Endotricha luteogrisalis*** Hampson

(Pl. 2, fig. 23)

E. luteogrisalis Hampson, 1896*a* : 136. (Bhutan.) Holotype ♂ in B.M.

Genitalia. ♂, Pl. 16, fig. 170.

MATERIAL EXAMINED. INDIAN SUBCONTINENT (North), 2 ♂.

14. ***Endotricha punicea*** **sp. n.**

(Pl. 1, fig. 15)

♂. Wing 8 mm. Head brown tinged with pink. Thorax with prominent tegulae of yellowish scales suffused with pink. Abdomen, yellow dorsally, suffused with pink, pink laterally. Coremata yellowish.

Forewing. Pinky red with broad yellow band. Apical $\frac{1}{3}$ of fringe yellow with brown base, rest pink with yellow tips. Dark brown terminal line, continuous. Terminal area deep rose pink. Subterminal line irregularly sinuous. Broad subterminal band pink suffused with black scales. Black discal spot. Median band bright yellow. Sub-basal and basal areas pinky red suffused with black.

Hindwing. Fringe pink, dark line through centre, white tipped. Terminal area brown, narrow. Colour and pattern as forewing.

Underside. Forewings mostly pink suffused with black. Yellow patch on anterior $\frac{1}{3}$ of median area.

♀. Similar.

Genitalia. ♂, Pl. 18, fig. 186. ♀ Pl. 30, fig. 262.

This species resembles *E. flavifusalis* Warr., but the genitalia are distinct.

MATERIAL EXAMINED. Holotype ♂, TIBET, " Tay-Tou-Ho, Chasseurs Thibetain, 1896 ", Brit. Mus. slide No. 4594, in B.M.

Paratypes. TIBET, 3 ♂, 6 ♀, (data as type).

15. ***Endotricha ruminalis*** (Walker)

(Pl. 2, fig. 27)

Agrotera ruminalis Walker, 1859, 17 : 387. (North Hindustan.) Holotype ♂ in B.M.
Endotricha ruminalis Walker ; Hampson, 1896*b* : 484.
Pyralis ibycusalis Walker, 1859, 19 : 899. (N. India.) Holotype ♀ in University Museum, Oxford.
Endotricha symphonialis Hampson, 1893 : 161. (Ceylon.) Holotype ♀ in B.M.

This species is variable in colour over its whole geographic range but the genitalia are constant. Hampson gives Burma and East Pegu as localities for this species (1896*a* : 135 and 1896*b* : 484) but I have not seen these specimens.

Genitalia. ♂, Pl. 16, fig. 171. ♀, Pl. 30, fig. 261.

MATERIAL EXAMINED. INDIAN SUBCONTINENT (North), 3 ♀ ; CEYLON, 1 ♂, 10 ♀ ; MALAYA, 4 ♀.

16. ***Endotricha loricata*** Moore

(Pl. 2, figs. 18 and 21)

E. loricata Moore, 1888 : 206. (Pakistan.) Holotype ♀ in B.M.
Pyralis ustalis Hampson, 1893 : 159. (Ceylon.) Holotype ♀ in B.M.

This species is similar externally to *E. affinitalis* Hering and the two species may be subspecifically related.

Genitalia. ♂, Pl. 16, fig. 172. ♀, Pl. 30, fig. 263.

MATERIAL EXAMINED. CEYLON, 1 ♂, 4 ♀ ; PAKISTAN, 1 ♀.

17. ***Endotricha affinitalis*** Hering

(Pl. 2, fig. 26)

E. affinitalis Hering, 1901 : 45. (Sumatra.) Lectotype selected, labelled " 1889, Sumatra Ieli, Sta.", in Warsaw Museum, Poland.

This species is known only from the lectotype, the remaining specimens having been lost. There are slight differences between this species and *E. loricata* Moore

Genitalia. ♀, Pl. 30, fig. 264.

MATERIAL EXAMINED. SUMATRA, 1 ♀ (in Warsaw Museum coll.).

18. ***Endotricha puncticostalis*** (Walker)

(Pl. 2, figs. 22 and 25)

Rhisina puncticostalis Walker, 1865, 34 : 1324. (Australia.) Holotype ♂ in B.M.
Endotricha ustalis Snellen, 1880 : 201. (Celebes.) Lectotype ♂ in Leiden, Holland.
Pyralis listeri Butler, 1888 : 546. (Christmas Is.) Holotype ♀ in B.M. **syn. n.**
Endotricha listeri Butler ; Butler *nec* Hampson, 1900 ; Zoological Record, 1900 : 278.

This species is very similar externally to " *Endotricha* " *compsopa* Meyrick (p. 447) but the genitalia are distinct. The specimens of *E. listeri* from Christmas Is. are slightly smaller than the Australian specimens but there is some overlap in size. I am not certain if the specimens from the Philippines, Java and Sumba are conspecific. Further material is needed.

Genitalia. ♂, Pl. 18, fig. 183. ♀, Pl. 28, fig. 250, the female is unique in the genus *Endotricha* in lacking a signum on the bursa.

MATERIAL EXAMINED. AUSTRALIA, 6 ♂, 9 ♀ ; SALAYER, 1 ♂ ; CHRISTMAS IS. (Indian Ocean), 6 ♂, 30 ♀. (Philippines 5 ♀, Sumba 1 ♀, Java 1 ♀.)

19. ***Endotricha wilemani*** West

(Pl. 2, fig. 28)

E. wilemani West, 1931 : 212. (Philippines.) Holotype ♀ in B.M.

I have only seen females of this species and am uncertain of their affinities.

Genitalia. ♀ Pl. 30, fig. 265.

MATERIAL EXAMINED. PHILIPPINES, 2 ♀.

20. ***Endotricha consobrinalis*** Zeller

This species is widespread over Africa. It is very variable in size and coloration and may be split into new subspecies when more material is available. The W. African specimens tend to be smaller than specimens from the rest of Africa and to have a smaller cornutus. The type of *E. jordana* Hampson, formerly in the Berlin Museum, was destroyed in the war (H. Hannemann, in litt.). I have only seen one ♂ from the type locality but this agrees very closely with *consobrinalis* Zeller. There is a tendency in this species to produce very dark forms over the equatorial part of its range, these may be seasonal forms. The Madagascan subspecies can be distinguished from the nominate subspecies by the larger and more strongly sclerotised cornutus of the former.

Endotricha consobrinalis consobrinalis Zeller

(Pl. 3, figs. 31, 32 and 34)

E. consobrinalis Zeller, 1852 : 24. (S. Africa.) Holotype ♂ in Natural History Museum, Stockholm.
Pyralis dissimulans Warren, 1897 : 126. (S. Africa.) Holotype ♂ in B.M.
Endotricha brunnea Warren, 1897 : 129. (S. Africa.) Holotype ♂ in B.M.
E. jordana Hampson, 1900 : 377. (Jordan.) Lectotype ♂ selected labelled " Jordan " in Berlin Museum, **syn. n.**

Genitalia. ♂, Pl. 18, fig. 182. ♀, Pl. 28, fig. 249.

MATERIAL EXAMINED. S. AFRICA, 3 ♂, 15 ♀, (including 3 ♀ in Transvaal Mus. Coll.) ; E. AFRICA, Kenya, 1 ♂, 3 ♀ ; Tanganyika, 5 ♀ (in Munich Mus. coll.) ; EGYPT, 4 ♂, 2 ♀ ; SUDAN, 2 ♀ ; W. AFRICA, Ghana, 1 ♂, 1 ♀ ; PALESTINE, 4 ♀ (1 ♀ in Berlin Mus. coll.) ; JORDAN, 1 ♂, 5 ♀ (1 ♂ and 3 ♀ in Berlin Mus. coll., 2 ♀ in Amsel coll.).

Endotricha consobrinalis meloui subsp. n.

(Pl. 3, fig. 33)

Externally similar to the nominate subspecies and showing the same high degree of variability. It can be distinguished from the nominate subspecies by its larger and more strongly chitinised cornutus.

Genitalia. As nominate subspecies, but with a more strongly chitinised cornutus in the ♂.

MATERIAL EXAMINED. Holotype ♂, MADAGASCAR, " Nanisa, near Tananarivo, December 1931, Olsoufieff, Pyralidae, Brit. Mus. slide No. 4703 ", in B.M.

Paratypes. MADAGASCAR, 5 ♂, 9 ♀.

21. *Endotricha rogenhoferi* Rebel

(Pl. 2, fig. 29)

E. rogenhoferi Rebel, 1892 : 249. (Canary Is.) Lectotype ♂ selected, labelled " Palma, Simony, 1889, Rebel, 26.iii.90, Litt. no. 18," in B.M.

This species is rather like pale specimens of *E. flammealis* Schiff. The male of *E. rogenhoferi* has well developed reflexed hairs on the costa of the valve which is not shown by any other Palaearctic species. I think that this species was probably derived from an African one, perhaps *E. consobrinalis* Zell. The female of *E. rogenhoferi* is unknown.

Genitalia. ♂, Pl. 18, fig. 187.

MATERIAL EXAMINED. CANARY IS., 2 ♂, (including 1 ♂ in Nat. History Museum, Vienna).

Several features in the genitalia (e.g. spined base to the sacculus process) suggest that the first three species of this group are closely related although they differ externally.

22. *Endotricha ellisoni* sp. n.

(Pl. 3, figs. 35 and 38)

♂. Wing 9 mm. Head, thorax and abdomen yellowish brown.

Forewing. Fringe yellowish, mauve at the base. Terminal line black, continuous. Terminal area reddish purple. Subterminal line indistinct, sinuous, white. Subterminal area reddish brown, irrorate with brown scales. Median area yellow, lightly suffused with brown scales, clearly demarcated on antemedial side, indistinctly so on postmedial side. Basal and subbasal areas brown. Costal margin black with small yellowish-white dots along length.

Hindwing. Similar. Subterminal area more reddish. Medial area clearly defined on each side.

Underside. Similar. Yellowish patch near apex of forewing, along the costa and $\frac{1}{3}$ across wing.

♀. Grey brown, heavily suffused with dark brown scales. Terminal area pinkish, rest of wing unmarked. Hindwings similar, ante- and postmedial lines faintly visible.

Genitalia. ♂, Pl. 16, fig. 173. ♀, Pl. 31, fig. 267.

This is a very variable species, both in size and coloration and will probably be split into subspecies when more material is available. Specimens from Kenya and Uganda are smaller, brighter red, and lack the distinct median area of the Abyssinian specimens. Specimens from S. Africa may also be subspecifically distinct. A single specimen from the Congo (in Tervuren coll.) has a cornutus of a slightly different shape and is only doubtfully referred here, otherwise the genitalia show little variation over the whole range.

MATERIAL EXAMINED. Holotype ♂, ABYSSINIA, " Harar, 8.iv.39 (Ellison) ", Brit. Mus. slide No. 4830, in B.M.

Paratypes. ABYSSINIA, 2 ♂, (data as type), 1 ♀, " Harar, 13.xii.37 ".

Other material. EAST AFRICA, Uganda, 3 ♂; Kenya, 1 ♂; CONGO, 1 ♂ (in Canadian Nat. Coll.); 1 ♂, (in Tervuren Mus.); SOUTH AFRICA, 4 ♂, 7 ♀, (all in Transvaal Museum).

23. *Endotricha niveifimbrialis* Hampson

(Pl. 3, fig. 41)

E. niveifimbrialis Hampson, 1906 : 211. (Sierra Leone.) Holotype ♀ in B.M.

Genitalia. ♂, Pl. 18, fig. 184. ♀, Pl. 28, fig. 251.

MATERIAL EXAMINED. SIERRA LEONE, 1 ♂, 1 ♀: CAMEROONS, 2 ♂.

24. ***Endotricha rosina*** Ghesquière

(Pl. 3, figs. 39 and 42)

E. rosina Ghesquière, 1942 : 228. (Congo.) Holotype ♀ in Tervuren, Belgium.

I am uncertain of the relationship of this species. I have examined the type but have been unable to find any other specimens to match it. Tentatively I am identifying two males from the Congo as this species, if this is correct then the species is related to *E. ellisoni* Whalley.

Genitalia. ♂, Pl. 16, fig. 174. ♀, Pl. 31, fig. 266.

MATERIAL EXAMINED. CONGO, 2 ♂, 1 ♀ (all in Tervuren).

25. ***Endotricha vinolentalis*** Ragonot

(Pl. 3, fig. 43)

E. vinolentalis Ragonot, 1891 : 525. (W. Africa.) Holotype ♀ in Paris Mus.

This species is very variable in colour. The males tend to have varying amounts of yellow ochre on the forewings and a distinct yellow ochre median area in the hind wings.

Genitalia. ♂, Pl. 16, fig. 175. ♀, Pl. 31, fig. 268.

MATERIAL EXAMINED. W. AFRICA ; Ivory Coast, 20 ♂, 30 ♀ ; Gambia, 4 ♂, 2 ♀ ; Cameroons, 1 ♀ ; Sierra Leone, 1 ♂ ; Ghana, 1 ♀. E. AFRICA ; Kenya, 1 ♂ (in Coryndon Mus. coll., Nairobi).

THE *ERYTHRALIS* SPECIES GROUP

The relationship of the species in this group is very interesting. The first four species are only known from the W. African island of São Thomé, whereas the last is a cosmopolitan African species. The first four have identical genitalia although they are very different in external appearance. These four are probably derived from the widespread African species.

26. ***Endotricha tamsi*** **sp. n.**

(Pl. 4, fig. 52)

♂. Wing 9·5 mm. Head, thorax, light brown irrorate with darker brown scales. Tegulae brown, with white scales.

Forewing. Chocolate brown with a prominent white patch near inner edge of hind margin of forewing. Fringe with apical third light, remainder brown with dark line through centre. Costa black with small whitish spots, the sub-apical one enlarged and continued as subterminal fascia. Terminal line black, slightly thickened between ends of each vein. Terminal area chocolate brown. Subterminal fascia pale, weakly sinuate. Median area chocolate brown, discal spot comma-shaped. Median line white, incomplete anteriorly, posteriorly enlarged to white patch with white mark pointing towards terminal margin. Rest of wing chocolate brown.

Hindwing. Fringe white, brown band running through, base narrowly white. Outer half of wing chocolate brown, becoming obscure towards hind margin. Rest of wing yellowish brown, orange in basal area.

Underside. Forewings grey brown with a reddish tinge. Hindwings similar. ♀ unknown.

Genitalia. ♂ similar to those of *E. altitudinalis* (Viette), Pl. 17, fig. 176.

MATERIAL EXAMINED. Holotype ♂, WEST AFRICA, "São Thomé, 2.xi.32" in B.M.

Paratypes. WEST AFRICA, 6 ♂, 1 ♀, (data as type).

27. ***Endotricha viettealis*** **nom. n.**

(Pl. 4, figs. 47 and 50)

Anobostra rosealis Viette, 1957 : 93. (São Thomé.) Holotype ♂ in Paris Mus.
Junior homonym of *E. rosealis* Walker, 1865.
Endotricha viettealis **nom. n.** for *E. rosealis* (Viette) **comb. n.**

There is some variation in the coloration of this species, but externally it is quite different from all other species of *Endotricha*.

Genitalia. ♂ and ♀ similar to those of *E. altitudinalis* (Viette), Pl. 17, fig. 176 and Pl. 31, fig. 270.

MATERIAL EXAMINED. W. AFRICA ; São Thomé, 16 ♂, 23 ♀ (including 1 ♂ and 1 ♀ in Paris Mus.).

28. ***Endotricha thomealis*** (Viette) **comb. n.**

(Pl. 4, figs. 48 and 51)

Anobostra thomealis Viette, 1957 : 92. (São Thomé.) Holotype ♂ in Paris Mus.

Genitalia. ♂ similar to those of *E. altitudinalis* (Viette), Pl. 17, fig. 176, ♀, Pl. 31, fig. 269.

MATERIAL EXAMINED. W. AFRICA ; São Thomé, 16 ♂, 23 ♀ (including 1 ♂ and 1 ♀ in Paris Mus.).

29. ***Endotricha altitudinalis*** (Viette) **comb. n.**

(Pl. 4, fig. 53)

Anobostra altitudinalis Viette, 1957 : 92. (São Thomé.) Holotype ♂ in Paris Mus.

Genitalia. ♂, Pl. 17, fig. 176. ♀, Pl. 31, fig. 270.

MATERIAL EXAMINED. W. AFRICA ; São Thomé, 4 ♂, 8 ♀ (including 1 ♂ and 3 ♀ in Paris Mus.).

30. ***Endotricha erythralis*** Mabille

(Pl. 4, figs. 46 and 49)

E. erythralis Mabille, 1900 : 742. (Madagascar.) Holotype ♀ in Paris Mus.
E. rosellita Ghesquière, 1942 : 228. (Congo.) Holotype ♀ in Tervuren, Belgium, **syn. n.**

This is a very variable species and will probably be split into subspecies when longer series are available. There is some variation in the size of the cornutus. The single specimen from Socotra may well represent a new subspecies, the typical reddish ground colour being replaced by a grey colour in this specimen.

Genitalia. ♂, Pl. 17, fig. 177. ♀, Pl. 31, fig. 271.

MATERIAL EXAMINED. MADAGASCAR, 13 ♂, 6 ♀; S. AFRICA, 5 ♂, 5 ♀ (all in Transvaal Mus.); CONGO, 2 ♂, 4 ♀ (all in Tervuren); SOCOTRA 1 ♂.

THE *MURECINALIS* SPECIES GROUP

The next four species are grouped together for convenience. They all possess certain individual peculiarities.

31. ***Endotricha murecinalis*** Hampson

(Pl. 3, fig. 44)

E. murecinalis Hampson, 1916 : 361. (New Guinea.) Holotype ♂ in B.M.

Genitalia. ♂, Pl. 17, fig. 178. ♀ unknown.

MATERIAL EXAMINED. NEW GUINEA, 1 ♂; DOREY IS. 1 ♂.

32. ***Endotricha gregalis*** Pagenstecher

(Pl. 3, fig. 45)

E. gregalis Pagenstecher, 1900 : 168. (New Britain.) Holotype ♂ in B.M.

This species is known only from the type.

Genitalia. ♂, Pl. 17, fig. 179

MATERIAL EXAMINED. NEW BRITAIN, 1 ♂.

33. ***Endotricha portialis*** Walker

(Pl. 4, fig. 54 and Pl. 11, fig. 153)

E. portialis Walker, 1859, 19 : 391. (Sarawak.) Holotype ♀ in B.M.
Doththa aecusalis Walker, 1859, 19 : 921. (Sarawak.) Holotype ♂ in University Museum, Oxford.
Endotrichopsis rhodopteralis Warren, 1895 : 467. (Japan.) Holotype ♂ in B.M.
Endotricha acrobasalis Snellen, 1892 : 155. (Java.) Holotype ♂ in Leiden, Holland.

This species is very constant in colour. The labial palps are very long and extend above the crown of the head (Pl. 11, fig. 153), a feature not shown by any other known species of *Endotricha*.

Genitalia. ♂, Pl. 17, fig. 180. ♀, Pl. 32, fig. 273.

MATERIAL EXAMINED. BORNEO, 2 ♂, 2 ♀; BALI, 2 ♂; JAPAN, 10 ♂, 2 ♀ (including 2 ♂ in Canadian Nat. coll., and 2 ♂ in Inoue coll.); JAVA, 1 ♂; SUMATRA, 1 ♂.

34. ***Endotricha ignealis*** Guenée

(Pl. 4, figs. 55 and 58)

E. ignealis Guenée, 1854 : 220. (Australia.) Holotype ♀ in B.M.
Pyralis docilisalis Walker, 1859, 19 : 913. (Australia.) Holotype ♀ in B.M., **syn. n.**
Endotricha aethopa Meyrick, 1884 : 79. (Australia.) Lectotype ♂ selected from Meyrick coll., labelled "Sydney, N.S. Wales, 12.9.81, Pyralidae Brit. Mus. slide no. 4492", in B.M., **syn. n.**

This species is unusual in the genus *Endotricha* in that vein R_3 arises before vein R_5 on the common stalk of $R_3 + R_4 + R_5$. All other known species of the genus have R_3 arising after R_5 on the common stem.

Genitalia. ♂, Pl. 17, fig. 181. ♀, Pl. 32, fig. 272.

MATERIAL EXAMINED. AUSTRALIA, 3 ♂, 3 ♀.

THE *MESENTERIALIS* SPECIES GROUP

The next six species form a very compact group. They all show certain features which are not found in other members of the genus. The enlarged basal segment of the antennae (fig. 155) and the basal process on the valve are peculiar to this group. Only one other species possesses the basal process (*E. melanobasis* Hampson) and this lacks the other features of the *mesenterialis* species group.

35. ***Endotricha olivacealis*** (Bremer)

(Pl. 4, figs. 56, 57, 59 and 60, and Pl. 11, fig. 154)

Rhodaria olivacealis Bremer, 1864 : 66. (E. Siberia.) Holotype ♀ in Leningrad Mus.
Endotricha flavifimbrialis Warren, 1891 : 69. (N. India.) Holotype ♂ in B.M. **syn. n.**
E. mesenterialis Walker, *partim*, *auct.*

I have not seen the type of this species but have a series from the type locality and a specimen which has been compared with the type by Dr. Kuznetzov. This is a very variable species both in size and coloration. The cornutus of the Indian specimens varies in size but is generally slightly larger than in the Manchurian specimens. This species will probably be split into new subspecies when more material is studied. *E. olivacealis* has long been confused with *E. mesenterialis* Walker, with which it has many similarities. The shape of the basal segment of the antennae affords the simplest means of separating these two species (Pl. 11, figs 154 and 155).

This species occurs with the very similar *E. mesenterialis* only in the Anamali Hills in India, otherwise the two species are geographically separated.

Genitalia. ♂, Pl. 19, fig. 191. ♀, Pl. 32, fig. 274.

MATERIAL EXAMINED. EAST SIBERIA, 11 ♂, 3 ♀; KOREA, 2 ♂, 1 ♀; FORMOSA, 4 ♂, 2 ♀; JAPAN, 4 ♂, 2 ♀ (including 3 ♂ and 2 ♀ in Inoue coll.); CHINA, 13 ♂, 9 ♀ (including 7 ♂ and 7 ♀ in Munich Mus. coll., and 2 ♂ and 2 ♀ in Amsel coll.); INDIAN SUBCONTINENT (North) 11 ♂, 3 ♀; (South) 3 ♂; BURMA, 1 ♂; WEST JAVA, 2 ♂, (both in Canadian Nat. coll.).

36. ***Endotricha mesenterialis*** Walker

This is a widespread species which is variable both in size and coloration.

In Samoa, Loyalty Is. and New Hebrides this species occurs alongside *E. plinthopa* and *E. propinqua*, which it closely resembles. It is probable that the islands mentioned were subject to two "invasions" of *mesenterialis* at different times. The first invasion had evidently differentiated sufficiently from the parent stock not to interbreed when the second invasion took place.

Endotricha mesenterialis mesenterialis (Walker)

(Pl. 5, figs. 61 and 64, and Pl. 11, fig. 155)

Doththa mesenterialis Walker, 1859, 17 : 285. (Sarawak.) Holotype ♂ in B.M.
Endotricha suffusalis Walker, 1859, 17 : 390. (Ceylon.) Holotype ♀ in B.M.
E. eoidalis Snellen 1895 : 112. (W. Java.) Lectotype ♂ in Leiden, Holland.
E. flavifusalis Warren ; Hampson *nec* Warren, 1896*b* : 483.
(*non*) *D. mesenterialis* Var., Walker, 1859, 19 : 920 (See *E. borneoensis*, p. 431). This subspecies varies in size but does not exceed 18·5 mm. wingspan.

Genitalia. ♂, Pl. 19, fig. 190. ♀, Pl. 32, fig. 276.

MATERIAL EXAMINED. BORNEO, 3 ♂; INDIAN SUBCONTINENT, 3 ♂, 2 ♀ (including 2 ♂ and 2 ♀ in Canadian Nat. coll.); CEYLON, 12 ♂, 12 ♀; MALAYA, 5 ♂, 1 ♀; NICOBAR Is., 1 ♂; SELAYER Is., 1 ♂; CHRISTMAS Is., (Indian ocean), 1 ♂; ST. MATTIAS Is., 1 ♂; BEGUM Is., 1 ♂; TONGA, 1 ♂; LOUISIADE ARCHIPELAGO, 1 ♂; NEW HEBRIDES, 5 ♂, 3 ♀.

Endotricha mesenterialis mahensis **nom. n., stat. n.**

(Pl. 5, figs. 63 and 66)

Endotricha flavofascialis Fryer, 1912 : 24. (Seychelles.) Holotype ♂ in B.M., junior homonym of *E. flavofascialis* Bremer, 1864 : 65.
E. mahensis **nom. n.** for *E. flavofascialis* Fryer, 1912.

In this subspecies the median area of the fore- and hindwing of the male are white, with a more grey colour in the wing than the nominate subspecies. The female of this subspecies is a very pale straw colour.

Genitalia. As nominate subspecies (Pl. 19, fig. 190 and Pl. 32, fig. 276).

MATERIAL EXAMINED. SEYCHELLES, 4 ♂, 5 ♀.

Endotricha mesenterialis obscura Butler **stat. n.**

(Pl. 5, figs. 62 and 65)

E. obscura Butler, 1886 : 427. (Australia.) Holotype ♀ in B.M.

The spines in the aedeagus are slightly larger in this subspecies than in the nominate one. The males of this subspecies are larger than the nominate race (18·5 mm. wingspan or over). The division between *obscura* and the nominate subspecies is small and there may be some overlap.

Genitalia. As nominate subspecies (Pl. 19, fig. 190 and Pl. 32, fig. 276).

MATERIAL EXAMINED. AUSTRALIA, 23 ♂, 6 ♀; NEW GUINEA, 2 ♂, 1 ♀ (1 ♀ in Canadian Nat. coll.); SAMOA, 1 ♂, 1 ♀; TAHITI, 3 ♂, 3 ♀; AUSTRAL IS., 1 ♂, 1 ♀; FIJI, 1 ♂, 2 ♀; NEW CALEDONIA, 2 ♂; KERMADEC IS., 1 ♂, 1 ♀; PALAU IS., 4 ♂, 1 ♀ (in U.S. Nat. Mus.).

37. *Endotricha propinqua* **sp. n.**

(Pl. 5, figs. 67 and 70)

♂. Wing 11·5 mm. Head, thorax and abdomen dark reddish brown. Tegulae with whitish scale.

Forewing. Fringe white. Costal margin yellow. Terminal margin narrowly black. Terminal area purplish red. Subterminal fascia white, thin. Subterminal area bright reddish purple. Median area broadly white. Basal and sub-basal areas purplish brown.

Hindwing. Similar. Terminal band of purplish red extending to posterior margin.

Underside. Paler. White median band of forewing obscure. Basal area brown. White patch on hind margin. Hindwing with prominent double red sinuous postmedial line. Posterior two-thirds of median wing area white, anterior third brown. Basal and sub-basal area brown.

♀. Variable in colour. Median wing area not white, often obscure. Forewing may be dull purplish red, heavily marked, to bright orange, almost unmarked.

Genitalia. ♂, Pl. 19, fig. 195. ♀, Pl. 32, fig. 275.

The shape of the sacculus process (Pl. 19, fig. 195) of this species is slightly different from that of *E. plinthopa* Meyer. This species occurs in the same localities as *E. mesenterialis obscura* Butl., which it closely resembles, differing in size and, in the male, in the shape of the juxta.

MATERIAL EXAMINED. Holotype ♂, NEW HEBRIDES, "Redcrest, Aneityum, 3 ml. N.E. Anelgauhat, 1200 ft., 1955 (Cheesman)", Brit. Mus. slide No. 4886, in B.M.

Paratypes. NEW HEBRIDES, 7 ♂, 5 ♀, (data as type); 3 ♂, 3 ♀, "Erromanga, 1930 (Cheesman)"; LOYALTY IS., 2 ♂, 1 ♀, "E. Lifu, Cap des Pins, 1950 (Cheesman)"; NEW CALEDONIA, 1 ♀, "Tinchialit, 1949 (Cheesman)".

38. *Endotricha plinthopa* Meyrick

(Pl. 5, figs. 68 and 71)

E. plinthopa Meyrick, 1886 : 214. (Samoa.) Holotype ♀ in B.M.

Genitalia. ♂, Pl. 19, fig. 192. ♀, Pl. 32, fig. 277.

MATERIAL EXAMINED. SAMOA, 3 ♂, 6 ♀.

39. *Endotricha sexpunctata* sp. n.

(Pl. 5, fig. 74)

♂. Wing 8 mm. Head white. Antenna strongly bipectinate, prominent process on first segment as in Pl. 11, fig. 155. Thorax brown.

Forewing. General colour brown with two large hyaline areas on each fore- and hindwing. Costal margin brown, interrupted with yellowish brown patches. Apical hyaline area oval with narrow hyaline streak leading to near apex of costa. Posterior hyaline area rectangular. Rest of wings brown.

Hindwing. Brown, large oval hyaline medial area.

Underside, forewings. Brown, prominent line of large yellow brown scales along veins Cu_{1a} and Cu_{1b}. Apical hyaline area absent, posterior reduced. Underside, hindwings: as upperside hindwings.

♀. Unknown.

Genitalia. ♂, Pl. 18, fig. 188.

This species has similar genitalia to *E. argentata*, but is easily separated from this species by the large hyaline areas in the wings of *E. sexpunctata*.

MATERIAL EXAMINED. Holotype ♂, MARIANAS Is., "Guam (Fulloway coll.)" in U.S. Nat. Mus. Paratype, MARIANAS Is., 1 ♂, (data as type), in U.S. Nat. Mus.

40. *Endotricha argentata* sp. n.

(Pl. 5, figs. 69, 72 and 75)

♂. Wing 8·2 mm. Head whitish, antenna strongly bipectinate, basal joint enlarged, (Pl. 11, fig. 155). Thorax and tegulae white intermixed with grey scales.

Forewing. General colour silvery grey. Costal margin yellow and white alternate patches. Tips of fringe white, base white and black alternately. Subterminal line yellowish white, sinuous. Antemedial line faintly visible edged with black scales. Base of forewings grey, heavily suffused with white scales. Terminal and medial area white with a few grey scales intermixed.

Hindwing. Area anterior to Cu_{1b} grey. Posterior margin as far as $2A$ black with a few red scales near tornus. Rest of wing between Cu_{1a} and $2A$ white. Ante- and post-medial fascia lightly demarcated with black scales.

Underside. Forewing: greyish brown, prominent line of long yellow scales along Cu_{1b}. Some large raised scales over base of cell. Hindwing, anterior margin with yellowish scales, area anterior to M_1 grey. Dark patches of scales over marginal part of Cu_2 and $2A$. Wing crossed by two zig-zag dark lines from $\frac{1}{3}$ distance from apex to near tornus. A few reddish scales along *Sc*, *R*, *Rs*, and M_1

♀ 1. Forewing. Costa yellow and black alternate patches. Fringe white, base of fringe black. Terminal line interrupted blackish. Subterminal line sinuous yellowish white. Median area yellowish, rest of wing reddish brown, irrorate with black.

Hind wing. Similar, paler. Underside silvery grey, irrorated with black.

♀ 2. Forewing. No median band. General colour orange brown, reddish purple in terminal area.

Hindwings. Similar, paler, irrorated with red.

These two forms of the female of this species are the extremes. Intermediates occur where the median area is just demarcated.

Genitalia. ♂, Pl. 18, fig. 189. ♀, Pl. 33, fig. 280.

This species has the typical genitalia and morphology of the *mesenterialis* species group but the silvery grey colour of the male is not found in any other known species of *Endotricha*.

MATERIAL EXAMINED. Holotype ♂, MARIANAS Is., "Rota-Rota, 23.vi.46, (Townes), at light", in U.S. National Museum.

Paratypes. MARIANAS Is., 2 ♂, 11 ♀, (data as type); 1 ♂, "Saipan, v.45"; 3 ♀, "Saipan, x.47", (all in U.S. Nat. Mus. Coll.).

THE *COSTAEMACULALIS* SPECIES GROUP

This consists of the next seven species. They have a basically similar genitalia pattern with a "T"-shaped uncus. Two species are known from the ♀ only (*ardentalis* Hampson and *sondaicalis* Snellen) but they are probably related to other species in this group.

41. ***Endotricha suavalis*** Snellen

(Pl. 5, fig. 73)

E. suavalis Snellen, 1895 : 113. (Java.) Holotype ♂ in Leiden, Holland.

Only the male of this species is known.

Genitalia. ♂, Pl. 20, fig. 198.

MATERIAL EXAMINED. 5 ♂ (including 1 ♂ in Leiden and 3 ♂ in Warsaw).

42. ***Endotricha similata*** (Moore)

(Pl. 3, figs. 37 and 40)

Doththa similata Moore, 1888 : 206. (N. India.) Holotype ♀ in B.M.
Endotricha sondaicalis Snellen ; Hampson *nec* Snellen, 1896*b* : 484.

Specimens of this species from Upper Burma have a slightly smaller hook on the end of the sacculus process and may represent a new subspecies.

Genitalia. ♂, Pl. 20, fig. 197. ♀, Pl. 33, fig. 281.

MATERIAL EXAMINED. INDIAN SUBCONTINENT (North), 5 ♂, 8 ♀; TIBET (South), 1 ♂; BURMA (Upper), 2 ♂, 4 ♀.

43. ***Endotricha ardentalis*** Hampson

(Pl. 6, fig. 88)

E. ardentalis Hampson, 1896*a* : 135. (N. India.) Holotype ♀ in B.M.

This species is known only from the type. I have examined a large number of N. Indian specimens without being able to match the genitalia of this species. It is possible that the curious structure at the opening of the bursa is a teratological condition. However, externally there are some slight differences between this species and *E. similata* Moore, so that I am retaining *ardentalis* as a good species.

Genitalia. ♀, Pl. 33, fig. 284.

MATERIAL EXAMINED. INDIAN SUBCONTINENT (North), 1 ♀.

44. ***Endotricha sondaicalis*** Snellen

(Pl. 2, fig. 30)

E. sondaicalis Snellen, 1880 : 200 (Celebes.) Holotype ♀ in the Leiden, Holland.
E. similata Moore ; Hampson *nec* Moore, 1896*b* : 484.

I have been unable to place this species, which is known from the type ♀ only. It may be related to *E. melanobasis* Hampson.

Genitalia. ♀ Pl. 33, fig. 285.

MATERIAL EXAMINED. CELEBES, 1 ♀ (in Leiden Mus. coll.).

45. ***Endotricha costaemaculalis*** Christoph

I have not seen the type of this species but have examined specimens which have been compared with the type by Dr. Kuznetzov. This species is almost identical with *E. fuscifusalis* Hampson from N. India. I have so little material available that I am placing *E. fuscifusalis* Hampson as a subspecies and describing a new, but closely related species, (*E. eximia* sp. n.) from N. India. The Russian, Chinese and Formosan specimens of *E. costaemaculalis* have small pits in the juxta of the male, whereas the Indian specimens have a smooth juxta. Intermediates occur in S. Tibet where, although the external appearance resembles that of the Indian subspecies, the juxta is slightly pitted.

Endotricha costaemaculalis costaemaculalis Christoph.

(Pl. 6, figs. 77, 79 and 80)

E. costaemaculalis Christoph, 1881 : 4. (E. Siberia.) Holotype ♀ in Leningrad Mus.
E. fuscobasalis Ragonot ; Hampson *nec* Ragonot, 1896*b* : 484.

Genitalia. ♂, Pl. 20, fig. 196. ♀, Pl. 32, fig. 278.

MATERIAL EXAMINED. EAST SIBERIA, 2 ♂, 4 ♀ ; KOREA, 1 ♀ ; CHINA, 1 ♀.

Endotricha costaemaculalis formosensis Hampson. **stat. n.**

(Pl. 6, fig. 76)

E. formosensis Hampson, 1916 : 363. (Formosa.) Holotype ♂ in B.M.

The Formosan subspecies is constant in external appearance. The genitalia are similar to the nominate subspecies.

MATERIAL EXAMINED. FORMOSA, 2 ♂, 6 ♀.

Endotricha costaemaculalis fuscifusalis Hampson. **stat. n.**

(Pl. 6, figs. 78 and 81)

E. fuscifusalis Hampson, 1896*a* : 134. (N. India.) Holotype ♂ in B.M.

The subterminal line is straight and lacks the " elbow " present in the nominate subspecies. Usually slightly larger than the nominate subspecies, it lacks the pitting on the juxta of the male. The genitalia are otherwise similar to the nominate subspecies.

MATERIAL EXAMINED. INDIAN SUBCONTINENT (North), 4 ♂, 5 ♀; TIBET (South), 3 ♂; CHINA (South), 1 ♂, 1 ♀.

46. *Endotricha eximia* sp. n.

(Pl. 6, figs. 82 and 85)

♂. Wing 9 mm. Head light grey-brown. Thorax grey-brown with white tegulae. Abdomen grey-brown suffused with black.

Forewing. Subapical part of fringe white, rest smoky grey. Terminal margin with small black dots. Terminal area reddish brown suffused with black. Subterminal line white edged with black, in costal quarter turns away from terminal margin of wing then descends downwards to hind margin of wing. Subterminal area blackish brown, lighter in costal quarter. Median band white, curved, edged with black. Sub-basal area suffused with orange-brown scales, intermixed with black. Basal area brown, irrorate with black. Costal margin black, interrupted with white semilunar marks, each with a darker central spot.

Hindwing. Ground colour off-white. Usually two white sinuous median lines edged with black, becoming very faint anteriorly.

Underside. Paler, distinct discal spot. Subterminal line conspicuous, black. Hindwings crossed by two prominent, black, slightly sinuous lines.

♀. Similar, basal area of forewing light brown with less black suffusion.

Genitalia. ♂, Pl. 21, fig. 202. ♀, Pl. 33, fig. 279.

This species is related to *E. costaemaculalis fuscifusalis* Hampson. It differs in the smaller size and paler hind wings. The male genitalia differ in the shape of the juxta and the presence of a thin line of spines in the aedeagus (there is a plate of spines in subsp. *fuscifusalis* Hamps.). The subterminal line of *eximia* Whalley varies in different specimens, and may be broken or heavily irrorate with black scales.

MATERIAL EXAMINED. Holotype ♂, INDIAN SUBCONTINENT (North), " Khasis, 1897 " Brit. Mus. slide No. 4654, in B.M.

Paratypes. INDIAN SUBCONTINENT (North), 4 ♂, 1 ♀, (data as type); 1 ♀ " Sikkim ", in Warsaw Museum.

47. *Endotricha fuscobasalis* Ragonot

(Pl. 6, figs. 83 and 86)

E. fuscobasalis Ragonot, 1891 : 526. (Punjab, Pakistan.) Holotype ♂ in Paris Mus.
E. costaemaculalis Christoph. ; *auctt.* (misidentification.)

The type specimen has a label in Meyrick's handwriting:—"seems to be *aethiopa* [i.e. *E. aethopa* Meyrick] but specimen is too worn ". In fact this is a very distinct species as can be seen from the genitalia. The large black patches on the anterior margin of the hind wing of *E. fuscobasalis* are particularly conspicuous. The ♀ is unknown.

Genitalia. ♂, Pl. 19, fig. 193.

MATERIAL EXAMINED. INDIAN SUBCONTINENT (North), 3 ♂.

The *NIGROMACULATA* Species Group

The next seven species are a heterogeneous collection but form a transitional series between the *costaemaculalis* species group and the *rhodomicta* species group. *E. borneoensis* is peculiar in the distinctive shape of the sacculus process.

48. ***Endotricha melanobasis*** Hampson

(Pl. 6, fig. 89)

E. melanobasis Hampson, 1916 : 358. (N. India.) Holotye ♂ in B.M.

Genitalia. ♂, Pl. 20, fig. 199. ♀, Pl. 33, fig. 282.

Material examined. Indian Subcontinent (North), 12 ♂, 1 ♀.

49. ***Endotricha nigromaculata*** **sp. n.**

(Pl. 6, figs. 84 and 87)

♂. Wing 9 mm. Head, thorax reddish purple.

Forewing. Fringe white. Terminal line black interrupted. Terminal area pinky mauve. Subterminal line indistinct posteriorly, sinuous, white. Conspicuous median curved fascia, white edged with black, curving regularly with apex of curve towards termen of wing. Costal margin of basal area brownish. Hind part of basal area with conspicuous black rectangle.

Hindwing. Terminal and subterminal areas pinky mauve. Median area whitish, edged with sinuous fascia white-edged with black. Basal area brown.

Underside. Paler than upperside.

♀. Wing 8 mm. Fringe with base purplish. Rest of fore and hind wing dull brown suffused with black. Small black discal spot. Underside paler. Subterminal fascia visible on hinder part of forewing.

Genitalia. ♂, Pl. 21, fig. 203. ♀, Pl. 28, fig. 248.

This species of *Endotricha* stands out from all the others by the striking black patch at the base of the forewing being clearly rectangular. The shape of the valve process resembles *E. fastigia*, sp. n., from New Guinea.

Material examined. Holotype ♂, Indian Subcontinent (North), " Khasis, Native coll." Brit. Mus. slide No. 4881, in B.M.

Paratypes. Indian Subcontinent, 1 ♂, 3 ♀, (data as type).

50. ***Endotricha fastigia*** **sp. n.**

(Pl. 7, figs. 91 and 94)

♂. Wing 9 mm. Head and thorax dark purplish red.

Forewing. Costal margin strongly concave, apex of wing very pointed. Fringe yellow. Terminal line of small black dots. Terminal area reddish purple. Subterminal line sinuous, pale. Subterminal area reddish yellow in costal part, hind part purplish red irrorate with black. Anterior part of median area yellowish on costal margin, narrowing posteriorly to thin line opening posteriorly. Rest of forewing purplish red.

Hindwing. Apex yellow, terminal and subterminal areas purplish red, decreasing in width posteriorly. Median area yellowish white narrowly edged with black. Basal and sub-basal areas purplish red.

Underside. Similar, paler. Median area with conspicuous fascia consisting of white edged with black on either side.

♀. Similar, paler. Apex of forewing less pointed.

Genitalia. ♂, Pl. 18, fig. 185. ♀, pl. 33, fig. 286.

The concave costa and distinctly pointed apex of the forewings make this species easily identifiable. Some variation in the shape of the median band occurs. This species is related to *E. rhodomicta* Hamps.

MATERIAL EXAMINED. Holotype ♂, NEW GUINEA, " Hydrographer Mts., 2,500 ft., May 1918, (Eichhorn Bros.) ", Brit. Mus. slide No. 4783, in B.M.

Paratypes. NEW GUINEA, 2 ♂, 1 ♀, (data as type) ; 1 ♂, 1 ♀, " Biagi, Mambare R., 5,000 ft. (Meek) ".

51. *Endotricha hœnei* sp. n.

(Pl. 7, fig. 99)

♂. Wing 10 mm. Head. Crown and frons yellowish. Thorax reddish brown suffused with yellow scales.

Forewing. General colour mauvish brown. Median band yellowish white. Fringe white anteriorly, black posteriorly. Terminal margin black. Terminal area mauve. Costal margin brown interrupted with white spots. Median area yellowish white, broad on costal margin, constricted posteriorly, almost disappearing on hind margin. Basal area brown, less mauve visible than distal part of wing.

Hindwing. Similarly coloured to forewing. Median yellowish white band broader, not narrowing posteriorly.

Underside. Paler, discal spot conspicuous, black. Sinuous subterminal line appears towards hind margin of forewing. Postmedian, narrow yellowish white band, similar antemedian one. Median band broader than on upperside.

♀. Unknown.

Genitalia. ♂, Pl. fig. 19, 194.

Externally, this species resembles a pale *E. metacuralis* Hampson (Formosa) but the genitalia are distinct.

MATERIAL EXAMINED. Holotype ♂, CHINA, " Linping, Kwangtung, 18.5.22 (Höne) ", Brit. Mus. slide No. 6159, in Höne coll, Bonn.

Paratypes. CHINA, 2 ♂, (data as type).

52. *Endotricha metacuralis* Hampson

(Pl. 7, fig. 96)

E. metacuralis Hampson, 1916 : 364. (Formosa.) Holotype ♀ in B.M.

Genitalia. ♂, Pl. 21, fig. 204. ♀, Pl. 33, fig. 283.

MATERIAL EXAMINED. FORMOSA, 1 ♂, 6 ♀.

53. *Endotricha faceta* sp. n.

(Pl. 7, figs. 98 and 101)

♂. Wing 12·5 mm. Head and thorax deep pinky red. Tegulae long, pinky red, black tipped.

Forewing. Fringe yellow. Terminal margin with a few black spots. Terminal area purplish irrorate with black. Subterminal line indistinct. Subterminal area orange-brown. Discal spot black, small. Median band yellow ochre. Antemedian line faintly black, basal area purplish red, irrorate with black. Costal margin with a few small white spots extending from the apex of the wing as far as the median area. Costal margin purplish red.

Hindwing. Mainly yellow, small purplish red mark near hind apex. Basal area purplish red.

Underside. Paler, hind wings all yellow with distinct ante- and postmedial lines, sinuous, red.

♀. Head and thorax dark pinky red.

Forewing. Entirely reddish brown with a faint discal orange-brown spot. Fringe bright yellow. Costal margin with white spots extending from apex to antemedial line.

Hindwing. Pale yellow, fringe bright yellow. Dark ante- and postmedial fascia. Median band reddish, obscure posteriorly. Basal area and area of vein 1*A* to hind margin dark purple-red.

Genitalia. ♂, Pl. 20, fig. 200. ♀, Pl. 34, fig. 287.

This is a very striking species and shows some similarities in the ♂ genitalia with *E. rhodomicta* Hampson.

MATERIAL EXAMINED. Holotype ♂, NEW GUINEA, "Mt. Goliath, about 130° long., Feb., 1911, (Meek)", Brit. Mus. slide No. 4784, in B.M.

Paratypes. NEW GUINEA, 6 ♂, 1 ♀, (data as type); 1 ♀, "Mt. Tafa, 8,500 ft., Mar. 1934 (Cheesman)".

54. *Endotricha borneoensis* Hampson

(Pl. 7, fig. 100)

E. borneoensis Hampson, 1916 : 365. (Sarawak.) Holotype ♂ in B.M.
Doththa mesenterialis var. Walker, 1859, 19 : 920.

The type of *borneoensis* is badly damaged and lacks an abdomen. This species is similar externally to *E. persicopa* Meyrick, from which it can be distinguished by the hindwing having only a trace of dark red at the apex of the wing, instead of all down the margin as in *persicopa*. The genitalia are very distinct. The Malayan specimens are slightly larger than the more southern specimens and may represent a new subspecies.

Genitalia. ♂, Pl. 20, fig. 201. ♀, Pl. 34, fig. 288.

MATERIAL EXAMINED. SARAWAK, 1 ♂; SOLOMON IS., 1 ♀; NEW GUINEA, 3 ♀; MALAYA, 1 ♂.

THE *RHODOMICTA* SPECIES GROUP

The genitalia of the species in this group and their very similar external appearances suggests that they are closely related. The last three species (*aureorufa*, *rhodomicta* and *munroei*) are sibling species. They appear to be geographically isolated in New Guinea but further collecting may show that their distribution overlaps.

55. *Endotricha persicopa* Meyrick

This is a bright pink and yellow species, easily separated from most other species in the genus. It is very constant in colour over its whole geographic range. The female of this species is peculiar in the genus *Endotricha* in having a stout spine on the signum of the bursa which projects into the cavity of the bursa itself.

Endotricha persicopa persicopa Meyrick

(Pl. 7, fig. 103)

E. persicopa Meyrick, 1889 : 506. (New Guinea.) Lectotype ♀ selected from syntypes ex. Meyrick coll. labelled, " New Guinea, S., [18]88 ", in B.M.
E. buralis Holland, 1900 : 582. (Buru I.) Holotype ♂ in Pittsburg, U.S.A., **syn. n.**
Genitalia. ♂, Pl. 21, fig. 206. ♀, Pl. 34, fig. 289.

MATERIAL EXAMINED. NEW GUINEA, 18 ♂, 23 ♀; NEW IRELAND, 1 ♂, 1 ♀; GOODENOUGH I., 3 ♂, 2 ♀ ; BURU I., 1 ♂ (in Carnegie Mus., Pittsburg, U.S.A.).

Endotricha persicopa paliolata Hampson. **stat. n.**

(Pl. 7, fig. 104)

E. paliolata Hampson, 1916 : 365. (Louisiade Archipelago.) Holotype ♂ in B.M.

The females of this species have the same peculiar spine in the bursa as the nominate subspecies.

Genitalia. ♂, Pl. 21, fig. 207 ; ♀, similar to nominate subspecies.

MATERIAL EXAMINED. ST. AIGNANS, 1 ♂; ROSSELL I., 5 ♂, 8 ♀; SUDEST I., 4 ♂, 6 ♀.

56. *Endotricha euphiles* Turner

(Pl. 8, fig. 106)

E. euphiles Turner, 1932 : 190. (Australia). Holotype ♂ in Queensland Mus., Brisbane, Australia.

I have not examined the type but have seen a paratype ♂ of this species. Externally the bright pink of this species resembles *E. flavifusalis* Warren but in the ♂ genitalia it is similar to *E. persicopa* Meyrick, of which it may be a subspecies.

Genitalia. ♂, Pl. 21, fig. 205.

MATERIAL EXAMINED. AUSTRALIA, 2 ♂ (1 ♂ in Queensland Mus., 1 ♂ in C.S.I.R.O., Canberra).

57. *Endotricha rhodomicta* Hampson

(Pl. 7, fig. 97)

E. rhodomicta Hampson, 1916 : 365. (New Guinea.) Holotype ♂ in B.M.

The specimen labelled " Type ♀, *rhodomicta* Hampson " by Hampson has proved to be a distinct species (*E. aureorufa* sp. n.). Externally *rhodomicta* is very similar

to *aureorufa*, but in the latter the patch of orange yellow on the median portion of the costa is larger and the whole insect is a more orange yellow than *rhodomicta*, which is lemon yellow.

Genitalia. ♂, Pl. 22, fig. 208. ♀, Pl. 34, fig. 292.

MATERIAL EXAMINED. NEW GUINEA, 9 ♂, 7 ♀.

58. *Endotricha aureorufa* sp. n.

(Pl. 7, figs. 92 and 95)

♂. Wing 11·5 mm. Head and thorax reddish brown. Tegulae long, reddish brown with black scales. Abdomen reddish brown with prominent coremata.

Forewing. Fringe yellow. Terminal line interrupted, black. Subterminal area pinky red. Subterminal line sinuous, yellowish. Costal margin with small yellow spots on apical third. Subterminal area pinky red, irrorate with brown, broad costal edge becoming narrower posteriorly. Broad median area golden yellow, orange-yellow in costal portion, broader posteriorly. Basal and sub-basal areas reddish brown.

Hindwing. Outer two-thirds all yellow. Narrow median sinuous brown line. Basal area reddish brown.

Underside. Paler median band, more pinky red on costal portion. Hindwings with conspicuous ante- and post-medial lines. Discal spot conspicuous.

♀. Similar, median line on hind wing more conspicuous, subterminal area of forewing more pinky red.

Genitalia. ♂, Pl. 22, fig. 209. ♀, Pl. 34, fig. 291.

MATERIAL EXAMINED. Holotype ♂, NEW GUINEA, " Mt. Goliath, 1911 (Meek) " Brit. Mus. slide No. 4896, in B.M.

Paratypes. NEW GUINEA, 4 ♂, 6 ♀ (data as type).

59. *Endotricha munroei* sp. n.

(Pl. 7, fig. 93)

♂. Wing 12·5 mm. Head reddish purple. Thorax reddish purple suffused with orange-brown. Tegulae long whitish. Abdomen purplish brown. Coremata prominent, orange-brown.

Forewing. Fringe yellow. Terminal line black, interrupted. Narrow terminal band of pinky red. Subterminal line consisting of small, separate, dark hemispheres. Discal area bright orange-yellow. Median band pale sulphur yellow, broader posteriorly. Discal spot black, comma-shaped. Rest of forewing reddish brown suffused with pinky red and black scales.

Hindwing. Fringe yellow. Terminal line brown, interrupted. Basal part of wing reddish brown suffused with pinky red and black scales. Hind margin and rest of wing pale sulphur yellow.

Underside. Similar, paler. Median line on hindwing zig-zag (not visible on upper side).

♀. Forewing similar, more pinky red suffusion and yellow paler. Hindwing with only median area pale sulphur yellow, broadening anteriorly. Terminal margin reddish brown, pale anteriorly. Median line black, conspicuous.

Genitalia. ♂, Pl. 22, fig. 210. ♀, Pl. 35, fig. 298.

This species is very similar both to *rhodomicta* Hampson and *aureorufa* Whalley but can be separated by its larger size and, in the male, by the differences in the aedeagus and juxta.

MATERIAL EXAMINED. Holotype ♂, NEW GUINEA, " Edie Cr., nr. Wau, Morobe District, 6,800 ft., 21–22 Sept. 1957 (Munroe and Holland) " Brit. Mus. slide No. 4938, in Canadian Nat. Coll.

PARATYPES. NEW GUINEA, 8 ♂, 3 ♀, (data as type) in Canadian Nat. Coll.; 1 ♂, " Mondo, 5,000 ft., 1.ix.34, (Cheesman); 2 ♂, ' Mt. Tafa, 8,500 ft., 1.ix.34 (Cheesman) ' ".

THE *FLAVIFUSALIS* SPECIES GROUP

The next five species fall into this group. *E. sandaraca* sp. n. and *E. rufofimbrialis* Warren are closely related. These two species are geographically isolated in Borneo and appear to have diverged sufficiently from one another to deserve specific rather than subspecific status.

60. ***Endotricha flavifusalis*** Warren

(Pl. 8, figs. 107 and 110)

E. flavifusalis Warren, 1891 : 70. (Sarawak). Lectotype ♀ selected, labelled, " Sarawak ", in B.M.

This species was described by Warren from one ♂ and one ♀ from Sarawak. The ♂ was subsequently selected by Hampson as the type of *E. borneoensis*. I have not seen a ♂ of *E. flavifusalis* from Sarawak but have selected the ♀ used in the original description as lectotype.

Genitalia. ♂, Pl. 23, fig. 214. ♀, Pl. 35, fig. 297.

MATERIAL EXAMINED. SARAWAK, 1 ♀; SUDEST I., 4 ♂, 6 ♀; ROSSELL I., 5 ♂, 4 ♀; ST. AIGNANS, 3 ♂, 1 ♀; WOODLARK I., 1 ♂, 2 ♀; MALAYA, 1 ♀.

61. ***Endotricha rufofimbrialis*** Warren

(Pl. 7, fig. 102 and 105)

E. rufofimbrialis Warren, 1891 : 69. (Sarawak.) Holotype ♀ in B.M.

The type specimen is in very bad condition, but specimens from Mt. Dulit (Sarawak) appear to be similar to it. This species is similar to *E. sandaraca* Whalley in genitalia, but is much smaller and with a slightly different pattern. There is one ♀ specimen from Bhutan which may be conspecific with this species.

Genitalia. ♂, Pl. 22, fig. 211. ♀, Pl. 35, fig. 299.

MATERIAL EXAMINED. SARAWAK, 4 ♂, 4 ♀; BORNEO, 1 ♀; (INDIAN SUBCONTINENT (North), 1 ♀).

62. ***Endotricha luteobasalis*** Caradja

(Pl. 6, fig. 90)

E. luteobasalis Caradja, 1935 : 29. (China.) Lectotype ♂ selected, labelled, " West Tienmu shan, China " in Natural History Mus., Bucharest.

I have examined one ♂ of this species from the original series of five specimens in the Caradja coll. This species shows some similarities to *rufofimbrialis* Warren. The ♀ is unknown.

Genitalia. ♂, Pl. 22, fig. 212.

MATERIAL EXAMINED. CHINA, 1 ♂ (in Nat. Hist. Mus., Bucharest).

63. *Endotricha sandaraca* sp. n.

(Pl. 8, figs. 108 and 111)

♂. Wing 11 mm. Head, crown yellow, frons red. Thorax reddish brown. Abdomen reddish brown. Coremata large, brown.

Forewing. Fringe bright yellow. Terminal line black, interrupted. Subterminal band pinky red. Subterminal line pale, sinuous, edged on outer margin with black. Subterminal area reddish brown, orange-brown along costal margin. Median area yellowish brown. Basal and sub-basal area reddish brown. Costal margin black with small white spots.

Hindwing. Fringe bright yellow. Terminal line black. Terminal area reddish brown edged with black anteriorly, narrowing posteriorly and becoming reddish purple. Median area large, bright yellow. Basal area reddish brown.

Underside. Similar, paler.

♀. Generally a dull brown colour. Discal spot black. Fringe bright yellow. Median band on hind wing almost obscure.

Genitalia. ♂, Pl. 22, fig. 213. ♀, Pl. 34, fig. 295.

This species is very conspicuous with the bright yellow hindwing. It is related to *E. rufofimbrialis* WARR.

MATERIAL EXAMINED. Holotype ♂, BORNEO, " Mt. Kinabalu, N. Borneo, 7,000 ft., May 31 1929 ", Brit. Mus. slide No. 4754, in B.M.

Paratypes. BORNEO, 18 ♂, 18 ♀, (data as type).

64. *Endotricha semirubrica* sp. n.

(Pl. 8, fig. 109)

♂. Wing 10 mm. Head yellowish, thorax and abdomen reddish brown suffused with yellow.

Forewing. Fringe yellow near apex of wing, reddish in posterior part. Terminal line with small black semilunar spots. Terminal area brown crossed by bands of red along veins. Subterminal line sinuous white, with red scales. Hind part of median area yellow. Discal spot black, comma-shaped. Rest of forewing brown, suffused with black. Reddish scales along veins.

Hindwing. Similar. Yellow medium band right across wing, broader than on forewing.

Underside. Similar, paler.

♀. Unknown.

Genitalia. ♂, Pl. 23, fig. 215.

Externally this species is similar to both *rufofimbrialis* WARR. and *sandaraca* Whalley, but the genitalia are very distinct.

MATERIAL EXAMINED. Holotype ♂, SARAWAK, " Poeh Mts., 3,500 ft., (Everett) ", Brit. Mus. slide No. 4580, in B.M.

Paratypes. MALAYA, 1 ♂, " Pahang, Cameroon Highlands, 8,700 ft., Dec. 1939 " ; 1 ♂, " Selangor Bukit Kuntu, 3,300 ft., (Pendlebury) " ; 1 ♂, " Pahang, Frazer Hill, 4,000 ft., 1932 " ; 1 ♂, " Pahang, Sungu Renglet, 1925, (Pendlebury) ".

THE *DENTICOSTALIS* SPECIES GROUP

The next six species form a less compact group than the preceding one.

65. ***Endotricha denticostalis*** Hampson

(Pl. 8, figs. 112 and 115)

E. denticostalis Hampson, 1906 : 210. (Pulo Laut.) Holotype ♂ in B.M.

The few specimens of this species examined are constant in colour. The costal margin of the forewing shows clearly the patches of scales giving the " toothed costa " of its name.

Genitalia. ♂, Pl. 23, fig. 216. ♀, Pl. 35, fig. 300.

MATERIAL EXAMINED. BORNEO, 2 ♂, 1 ♀ ; PULO LAUT, 1 ♂.

66. ***Endotricha conchylaria*** **sp. n.**

(Pl. 9, fig. 128)

♂. Wing 11·5 mm. Head light reddish brown. Thorax reddish purple with yellowish brown tegulae. Abdomen brown. Coremata yellowish, conspicuous.

Forewing. Fringe white with black dots near the base. Terminal margin reddish purple with small semilunar black dots. Terminal band reddish purple. Narrow, sinuate, subterminal line white. Subterminal band reddish purple irrorated with black. Median band yellow, continued along costal margin as a narrow strip to the subterminal line.

Antemedial line thin, sinuous white, indistinct. Basal area reddish purple irrorated with yellow, particularly in posterior half. Inconspicuous black discal spot.

Hindwing. Subterminal line black, interrupted. Broad border purplish red irrorated with black. Median band yellow edged on both sides with sinuous white line. Basal area purplish red.

Underside. Paler, subterminal line sharply curved inwards in middle third. Comma-shaped discal spot surrounded by yellow scales.

♀. Unknown.

Genitalia. ♂, Pl. 23, fig. 217.

Externally, this species is like *E. albicilia* Hamps. but the genitalia are quite distinct.

MATERIAL EXAMINED. Holotype ♂, NEW GUINEA, " Eitape, on coast 90 miles from Dutch border, 1917 ", Brit. Mus. slide No. 4760, in B.M.

Paratypes. MOLUCCAS, 1 ♂, " Batjan, Aug. 1897 (Doherty) " ; 1 ♂, " Obi Major (Waterstradt) ".

67. ***Endotricha capnospila*** Meyrick

(Pl. 8, figs. 113 and 116)

E. capnospila Meyrick, 1932 : 247. (Fiji.) Lectotype ♂ selected, labelled " Lautoka, Fiji., H.P., 28.x.30, Pyralidae, Brit. Mus. slide no. 4547 ", in B.M.

Externally this species is like *E. simplex* Janse, but it can be separated from the male of that species by the large black oval scale patch at the base of veins Cu_{1a} and M_3 in the hind wing of *capnospila*.

Genitalia. ♂, Pl. 24, fig. 223. ♀, Pl. 35, fig. 302.

MATERIAL EXAMINED. FIJI, 2 ♂, 2 ♀.

68. ***Endotricha chionocosma*** Turner

(Pl. 8, fig. 120)

E. chionocosma Turner, 1904 : 182. (Australia.) Holotype ♀ in C.S.I.R.O., Canberra, Australia.

This species is known only from the type.

Genitalia. ♀, Pl. 35, fig. 301.

MATERIAL EXAMINED. AUSTRALIA, 1 ♀ (in C.S.I.R.O., coll.).

69. ***Endotricha albicilia*** Hampson

(Pl. 8, figs. 118 and 119)

E. albicilia Hampson, 1891 : 130. (N. India.) Holotype ♂ in B.M.
E. albicilia Hampson ; Hampson *nec* Wileman ; Inoue, 1955 : 146.

Wileman (1911 : 368), records this species from Japan. This is incorrect since this species appears to be confined to the Indian subcontinent, Ceylon and the Andaman Is. Inoue (1955 : 146) suggests that the Japanese record of *E. albicilia* is a misidentification of *E. consocia* Butler which I think is correct. He, however, attributes *albicilia* to Wileman whereas it is a Hampson species.

Genitalia. ♂, Pl. 24, fig. 224. ♀, Pl. 35, fig. 303.

MATERIAL EXAMINED. INDIAN SUBCONTINENT, 14 ♂, 4 ♀; CEYLON, 2 ♂, 4 ♀; ANDAMAN IS., 4 ♂, 4 ♀.

70. ***Endotricha fuliginosa*** sp. n.

(Pl. 8, figs. 114 and 117)

♂. Wing 11 mm. Head and thorax reddish, suffused with yellow scales. Tegulae reddish pink. Abdomen brown.

Forewing. Costa concave, with a distinct angle $\frac{1}{3}$ from apex. Fringe white, base of fringe pinky red. Terminal line a few widely separated black dots. Terminal area narrow, reddish pink. Subterminal line sinuous, indistinct posteriorly. Subterminal area orange-brown, anteriorly suffused with black, dark posteriorly. Median area and basal area pinky red heavily suffused with black scales. Costal margin with small white spots.

Hindwing. Similar, but median area clearly defined by black and white fascia. Median area pinky red. Basal area brown.

Underside. Smoky grey, conspicuous yellow hairs in anal area of forewing projecting downwards and large smoky black area in anterior part of hindwing.

♀. Unknown.

Genitalia. ♂, Pl. 23, fig. 218.

This species is related to *E. cruenta*, sp. n.

Material examined. Holotype ♂, New Guinea, " Hydrographer Mts., Jan. 1918 (Eichhorn) ", Brit. Mus. slide No. 4769, in B.M.

Paratypes. New Guinea, 2 ♂, " Upper Aroa River, 1903 (Meek) "; 1 ♂, " Cyclops Mts., Sabron Camp, 1,200 ft., 15.v.36, (Cheesman) ".

71. *Endotricha cruenta* sp. n.

(Pl. 9, fig. 129)

♂. Wing 11 mm. Head and thorax bright red suffused with yellow scales. Tegulae red with yellow scales.

Forewing. Fringe pale yellow, base of fringe black. Terminal line yellowish edged with black. Terminal area deep reddish purple. Subterminal area reddish, costal part narrowly orange. Median area yellow on antemedial side, yellow suffused with red postmedially. Postmedial line indistinct. Antemedial line almost straight. Sub-basal area bright reddish purple. Basal area yellow, red on costal portion. Costal margin reddish purple with white spots, orange between apex and portion of postmedial line.

Hindwing. Terminal and subterminal band reddish purple, broad anteriorly, narrowing posteriorly. Rest of hind wing yellow.

Underside. Similar, legs red.

♀. Paler, more brown in subterminal area. Yellow band on forewings narrower. Basal area brown. Reddish brown basal area in hindwing.

Genitalia. ♂, Pl. 23, 219. ♀, Pl. 37, fig. 313.

The specimens of this species that I have examined vary in the intensity of the colour. The Snow Mts. specimen has a larger patch of yellow on the hindwings. The size also varies, the wing of the Kokoda male being 9 mm. against 11 mm. of the type. The genitalia of all the males are identical. This species has a similar genitalia structure to *E. fuliginosa* Whalley to which it is probably related.

Material examined. Holotype ♂, New Guinea, " Upper Aroa River, Febr. 1903 (Meek) ", Brit. Mus. slide No. 4755, in B.M.

Paratypes. New Guinea, 1 ♂, " Kokoda, 1,200 ft. vii.33, (Cheesman) "; 1 ♂, " Upper Setakwa River, Snow Mts., Sept. 1910 "; 1 ♂, " Waigeu, Camp Nok, 2,500 ft., iv.38, (Cheesman) ".

The *simplex* Species Group

The next two species have developed a totally distinct external appearance on one small island. The subspecies of *simplex* presents a more typical " *Endotricha* " appearance than the nominate one.

72. *Endotricha simplex* Janse

This species is probably related to *E. capnospila* Meyr. The species in the *simplex* group are probably derived from a common ancestor and have diverged on the islands of the Moluccas.

Endotricha simplex simplex Janse

(Pl. 9, figs. 121 and 124)

E. simplex Janse, 1924 : 506. (Moluccas Is.) Holotype ♂ in Transvaal Museum coll., Pretoria S. Africa.

This subspecies is larger than subsp. *rosselli*, (wingspan 26 mm. *simplex*, *rosselli* 22 mm.).

Genitalia. ♂, Pl. 24, fig. 220. ♀, Pl. 36, fig. 305.

MATERIAL EXAMINED. MOLUCCAS IS., 4 ♂, 3 ♀ (2 ♂ and 2 ♀ in Transvaal Mus.).

Endotricha simplex rosselli subsp. n.

(Pl. 9, fig. 127)

♂. Wing 11 mm. Head and thorax rust brown. Abdomen brown. Coremata conspicuous, rust brown.

Forewing. General colour dark rust brown, almost unmarked. Fringe white. Subterminal line yellowish near costa, obscure further back. Faint lines on each side of edge of median area. Costal margin with a few small light areas.

Hindwing. Outer margin rusty brown terminating before the hind margin of the wing. Anterior part of marginal area yellowish buff. Two faint yellowish buff median lines. Basal area yellowish buff.

♀. General colour slightly less red than male, no yellowish buff on hind wings. Median band of hind wing reddish brown faintly continued to forewing. Fringe white.

Genitalia. ♂, Pl. 24, fig. 222. ♀, as nominate subspecies (Pl. 36, fig. 305).

Some variation in size and colour is shown by this subspecies. It is much smaller than the nominate race (wing 13 mm. in the nominate race).

MATERIAL EXAMINED. Holotype ♂, LOUISIADE ARCHIPELAGO, " Rossell I., Mt. Rossell (Eichhorn), 26.iii.15 ", Brit. Mus. slide No. 4555, in B.M.

Paratypes. LOUISIADE ARCHIPELAGO, 6 ♂, 4 ♀, (data as type) ; 3 ♂, " Sudest I." ; 1 ♀, " Squally I.".

73. *Endotricha variabilis* Janse

(Pl. 9, figs. 122 and 125)

E. variabilis Janse, 1924 : 504. (Moluccas Is.) Holotype ♂ in Transvaal Mus. coll., Pretoria S. Africa.

Genitalia. ♂, Pl. 24, fig. 221. ♀, Pl. 36, fig. 304.

MATERIAL EXAMINED. MOLUCCAS IS., 4 ♂, 4 ♀ (2 ♂, 2 ♀ in Transvaal Mus. coll.).

The *ENCAUSTALIS* Species Group

The next four species are not closely related. They are all from the Australian-New Guinea region.

74. ***Endotricha encaustalis*** Hampson

(Pl. 9, fig. 132)

E. encaustalis Hampson, 1916 : 359. (New Guinea.) Holotype ♂ in B.M.

Genitalia. ♂, Pl. 24, fig. 225. ♀, Pl. 36, fig. 306.

Material examined. New Guinea, 8 ♂, 2 ♀.

75. ***Endotricha approximalis*** Snellen

(Pl. 9, fig. 135)

E. approximalis Snellen, 1895 : 115. (Java.) Lectotype ♀ in Leiden, Holland.
E. xanthorhodalis Hampson, 1916 : 360. (Australia.) Holotype ♂ in B.M. **syn. n.**
E. periphaea Turner, 1937 : 69. (Australia.) Holotype ♀ in C.S.I.R.O., Canberra, Australia, **syn. n.**

It is possible that the Australian-New Guinea specimens may represent a subspecies, but more material is needed. The single specimen from the Philippines is very similar to the type of the species.

Genitalia. ♂, Pl. 26, fig. 235. ♀, Pl. 37, fig. 310.

Material examined. Java, 1 ♀ (lectotype, in Leiden); Philippines, 1 ♂; New Hebrides, 2 ♂, 2 ♀; Woodlark Is., 1 ♂; New Guinea, 1 ♂; Australia, 6 ♂, 8 ♀.

76. ***Endotricha dispergens*** Lucas

(Pl. 9, figs. 123 and 126)

E. dispergens Lucas, 1891 : 306. (Australia.) Holotype ♂ in S. Australian Mus., Adelaide, Australia.

The abruptly truncate forewing of the ♂ of this species easily separates it from any other known species of *Endotricha*.

Genitalia. ♂, Pl. 26, fig. 233. ♀, Pl. 37, fig. 311.

Material examined. Australia, 19 ♂, 4 ♀.

77. ***Endotricha pyrosalis*** Guenée

(Pl. 9, figs. 131 and 134)

E. pyrosalis Guenée 1854 : 219. (Australia.) Holotype ♂ in Paris Mus.
Messatis sabirusalis Walker, 1859, 19 : 918. (Australia.) Holotype ♂ in B.M.
Tricomia auroralis Walker, 1865, 34 : 1259. (Australia.) Holotype ♀ in B.M.
Pacoria albifimbrialis Walker, 1865, 34 : 1255. (Australia.) Holotype ♂ in B.M.
Rhodaria robinia Butler, 1882 : 96. (Australia.) Holotype ♂ in B.M.
Endotricha ignealis Guenée ; Hampson *nec* Guenée, 1896*b* : 483.

This species was recorded from New Zealand by Hudson (1928 : 205) as having been captured on Mt. Denman in 1911, this is the only record of this species outside Australia and Tasmania.

Genitalia. ♂, Pl. 26, fig. 232. ♀, Pl. 37, fig. 312.

MATERIAL EXAMINED. AUSTRALIA, 17 ♂, 4 ♀; TASMANIA, 1 ♂.

THE *PSAMMITIS* SPECIES GROUP

The position of the next two species is uncertain. They are closely related to one another and may be geographical representatives of the same species.

78. ***Endotricha psammitis*** Turner

(Pl. 10, fig. 137)

E. psammitis Turner, 1904 : 183. (Australia.) Holotype ♂ in C.S.I.R.O. coll., Canberra, Australia.

E. lignitalis Hampson, 1916 : 360. (Australia.) Holotype ♂ in B.M., **syn. n.**

Genitalia. ♂, Pl. 26, fig. 236. ♀, Pl. 34, fig. 296.

MATERIAL EXAMINED. AUSTRALIA, 3 ♂ (1 ♂ in C.S.I.R.O. coll.); TAMBORA I., 2 ♂; SELAYER I., 21 ♂, 7 ♀.

79. ***Endotricha nicobaralis*** Hampson

(Pl. 10, fig. 138)

E. nicobaralis Hampson, 1906 : 210. (Nicobar Is.) Holotype ♂ in B.M.

Genitalia. ♂, Pl. 26, fig. 234. ♀, Pl. 37, fig. 314.

MATERIAL EXAMINED. NICOBAR IS., 2 ♂, 1 ♀; LOWER BURMA, 3 ♂, 2 ♀.

THE *COREACEALIS* SPECIES GROUP

The next seven species all show some degree of reduction of the gnathus, but the gnathus arms are always present.

80. ***Endotricha coreacealis*** Pagenstecher

(Pl. 9, figs. 130 and 133)

E. coreacealis Pagenstecher, 1884 : 266. (Amboina.) I have been unable to trace the type of this species and therefore erect a neotype labelled "Amboyna, Feb., 1892, W. Doherty," in B.M.

The forewing of this species has *Sc* and R_1 anastomosing, a condition also found in *E. chionosema* Hampson. The ♀ is unknown.

Genitalia. ♂, Pl. 25, fig. 226.

MATERIAL EXAMINED. AMBOINA, 3 ♂; NEW GUINEA, 8 ♂.

81. *Endotricha luteopuncta* sp. n.

(Pl. 10, fig. 140)

♂. Wing 10 mm. Head, thorax light brown, irrorate with darker brown.

Forewing. Large circular yellow spot between veins 1*A* and Cu_{1b}. Small black discal spot. Fringe dark red and black. Terminal line black, interrupted. Subterminal area reddish purple. Subterminal line sinuous. Rest of wing reddish brown, paler in basal and sub-basal areas.

Hindwing. Apex white, yellow streak running length of cell. Rest of hind wing reddish brown, paler in basal area. Terminal area reddish.

Underside. Paler, smoky black line extending from subterminal line to basal area across forewing.

♀. Darker reddish brown, lacks yellow median spot. Median band of hind wing feebly marked.

Genitalia. ♂, Pl. 25, fig. 227. ♀, lacks abdomen.

The conspicuous yellow spot in the forewing of the male is the most obvious external character. This species resembles *E. coreacealis* Pag. in external shape, while the genitalia show similarities with *E. lobibasalis* Hamps.

Material examined. Holotype ♂, Solomon Is., "Guadalcanal, Tapananje, Dec. 1955, (Bradley)", Brit. Mus. slide No. 4764, in B.M.

Paratypes, Solomon Is., 5 ♂, 1 ♀, "Bougainville, 1904 (Meek)"; 2 ♂, "Guadalcanal, 1901, (Meek)".

82. *Endotricha dyschroa* Turner

E. dyschroa Turner, 1918 : 284. (Norfolk I.) Holotype ♂ in South Australian Mus., Adelaide, Australia.

I have examined a slide of the genitalia and a colour photograph of the type. The specimen is very badly damaged and I am uncertain of the affinities of this species. No figure of the moth is given.

Genitalia. ♂, Pl. 25, fig. 228.

Material examined. Norfolk I. (N.N.W. of New Zealand), 1 ♂ (in South Australian Mus.).

83. *Endotricha lobibasalis* Hampson

(Pl. 10, fig. 141)

E. lobibasalis Hampson, 1906 : 208. (Australia.) Holotype ♂ in B.M.

Genitalia. ♂, Pl. 25, fig. 229. ♀ unknown.

Material examined. Australia, 2 ♂; Dampier I., 1 ♂; New Guinea, 1 ♂.

84. *Endotricha chionosema* Hampson

(Pl. 10, figs. 142 and 145)

E. chionosema Hampson, 1916 : 357. (Goodenough I.) Holotype ♂ in B.M.

In the forewing of this species vein *Sc* clearly anastomoses with vein R_1 one-third of the way from the apex of the wing, a character also found in *E. coreacealis* Pag.

Genitalia. ♂, Pl. 25, fig. 230. ♀, Pl. 36, fig. 307.

MATERIAL EXAMINED. GOODENOUGH I., 3 ♂, 3 ♀; DAMPIER I., 2 ♂.

85. *Endotricha peterella* sp. n.

(Pl. 10, figs. 136 and 139)

♂. Wing 8 mm. Head and thorax grey brown irrorate with red scales.

Forewing. General colour light grey brown, basal area dark brown. Costal margin black and yellowish brown alternate patches. Subcostal area reddish. Fringe white and black alternately. Terminal line black, interrupted. Subterminal area reddish brown near apex, lighter posteriorly. Subterminal line conspicuous, sinuous, edged with black. Discal spot black, black scales in patch from discal spot across to wing margin between R_5 and M_1. Scattered black scales outlining median yellowish brown area. Most of subterminal area black posteriorly, remaining part grey brown. Median area edged on antemedial side by conspicuous broad black patch of scales. Basal area black.

Hindwing. Mostly light coloured, black fringe and terminal line. Black ante- and postmedial fascia.

Underside. Paler forewings, few black scales.

Hindwing. Light coloured except for conspicuous median black wing fascia and a double black line of scales postmedially.

♀. General colour dark reddish purple. Median area reddish, irrorate with black scales. Subterminal line conspicuous. Underside dark red-brown, heavily irrorate with black scales.

Genitalia. ♂, Pl. 25, fig. 231. ♀, Pl. 34, fig. 294.

MATERIAL EXAMINED. Holotype ♂, "CAROLINE IS., Palau I., Koror I., Limestone ridge, at light, v.57 (Sabrosky)", in U.S. Nat. Mus.

Paratypes. CAROLINE IS., 1 ♂, 3 ♀, (data as type).

I am uncertain of the relationship of this species. The cornutus has some similarity with *E. pyrrhaema* Hamps. but *E. peterella* has a weakly developed gnathus whereas this is absent in *E. pyrrhaema* Hamps.

86. *Endotricha pyrrhaema* Hampson

(Pl. 10, fig. 148)

E. pyrrhaema Hampson, 1916 : 364. (Amboina.) Holotype ♂ in B.M.

This species appears to lack a gnathus. The gnathus arms are well developed but it is impossible to separate the gnathus from the surrounding membranes.

Genitalia. ♂, Pl. fig. 26, 237. ♀, Pl. 36, fig. 308.

MATERIAL EXAMINED. NEW GUINEA, 2 ♀; AMBOINA, 4 ♂.

THE *PYRRHOCOSMA* SPECIES GROUP

The next five species have extremely similar genitalia but they are all distinct from one another in external appearance. I prefer to regard them as a superspecies complex rather than subspecies of one species. All the species in this group lack a gnathus but the gnathus arms are well developed.

87. ***Endotricha pyrrhocosma*** Turner

(Pl. 10, fig. 144)

E. pyrrhocosma Turner, 1911 : 121. (Australia.) Holotype ♂ in C.S.I.R.O., Canberra, Australia.

Genitalia. ♂, Pl. 27, fig. 240 and Pl. 28, fig. 245 (cornutus). ♀ unknown.

Material examined. Australia, 4 ♂; Manovolka I., 1 ♂; Woodlark I., 1 ♂.

88. ***Endotricha thermidora*** Hampson

(Pl. 10, figs. 143 and 146)

E. thermidora Hampson, 1916 : 359. (New Guinea.) Holotype ♂ in B.M.

This species is larger than *E. pyrrhocosma* Turner (wing 10 mm.; *pyrrhocosma*, wing 8 mm.) and lacks the pronounced reddish-brown basal area to the hind wing. The cornutus in the aedeagus is also a slightly different shape.

Genitalia. ♂, Pl. 27, fig. 238 and Pl. 28, fig. 243 (cornutus). ♀, Pl. 36, fig. 309.

Material examined. New Guinea, 3 ♂; Admiralty Is., 1 ♂; Yamma I., 1 ♂; Solomon Is., 2 ♂; New Hannover, 6 ♂, 3 ♀; Dampier I., 3 ♂, 2 ♀; New Britain, 2 ♂, 1 ♀; Sudest I., 2 ♂.

89. ***Endotricha bradleyi*** Whalley

(Pl. 10, fig. 147)

E. bradleyi Whalley, 1962 : 105. (Rennel I.) Holotype ♂ in B.M.

The females are slightly smaller than the males and generally darker.

Genitalia. Pl. 27, fig. 242 and Pl. 28, fig. 247 (cornutus). ♀, Pl. 34, fig. 290.

Material examined. Solomon Is. (Rennel I.), 3 ♂, 2 ♀.

90. ***Endotricha mariana*** **sp. n.**

(Pl. 10, fig. 151)

♂. Wing 8·3 mm. Head reddish brown, irrorate with black. Thorax reddish brown, irrorate with black, tegulae yellowish brown.

Forewing. General colour reddish brown, with white median area, prominent discal spot. Costal margin brown with yellowish marks. Cilia white. Terminal line black, interrupted. Indistinct subterminal line. Terminal area blackish, irrorate with red scales. Subterminal area black with a few red scales. Discal spot oval, black. Median area white, narrowing posteriorly. Basal and sub-basal area black, irrorate with red and yellow scales.

Hindwing. Similar, greyer. Prominent sinuous median white line. Basal area white, irrorate with a few black and red scales.

Underside. Pale reddish brown, discal spot prominent. Median area of forewing not clearly demarcated, on hind wing median area edged with black fascia.

♀. Unknown.

Genitalia. ♂, Pl. 27, fig. 241 and Pl. 28, fig. 246 (cornutus).

This has the typical ♂ genitalia of the *pyrrhocosma* group. It differs from the other members of the group in the upturned (instead of down-turned) sacculus process and there is a slight difference in the shape of the cornutus.

MATERIAL EXAMINED. Holotype ♂, MARIANAS Is., " GUAM, viii.45 ", in U.S. Nat. Mus.

Paratypes. MARIANAS Is., 1 ♂, " Pt. Oca, vi.45 ".

91. ***Endotricha separata*** **sp. n.**

(Pl. 10, figs. 149 and 150)

♂. Wing 6·9 mm. Head and thorax yellowish brown with a few reddish brown and black scales intermixed.

Forewing. General colour reddish brown, yellowish brown on hind margin. Costal margin black and yellowish brown alternate patches. Fringe chestnut. Terminal area purplish overlaid with dark red scales. Subterminal line sinuous, yellowish. Median area yellowish, enlarging on posterior margin. Discal spot conspicuous. Rest of wing chestnut brown.

Hindwing. Marginal area reddish brown with black scales, area enlarging near tornus. Basal area reddish brown. Medial area yellowish brown, narrowing posteriorly.

Underside. Reddish costal area on forewing, discal spot conspicuous. Anal area with grey scales.

Hindwing. Reddish on anterior margin, several transverse fasciae of red and black scales from anterior margin to tornus.

♀. Dark red forewing, discal spot black. Basal area brown. Hindwings with median area narrow, reddish, no large yellow area as in male. Basal and terminal areas heavily irrorate with black scales. Underside, as male.

Genitalia. ♂, Pl. 27, fig. 239 and Pl. 28, fig. 244 (cornutus). ♀, Pl. 34, fig. 293.

This species has similar genitalia to the Australian *E. pyrrhocosma* Turner, but is distinct externally.

MATERIAL EXAMINED. Holotype ♂, CAROLINE Is., " Yap I., Weloy, at light, (Sabrosky) " in U.S. Nat. Mus.

Paratypes. CAROLINE Is. 2 ♂, " Gagil Gachapar, at light, vi.57 (Sabrosky) "; 5 ♂, 2 ♀, " Weloy, vi.57, (Sabrosky) "; 2 ♀, " Kolonia, vi.57, (Sabrosky) ".

SPECIES INDETERMINATAE

It has not been possible to identify the following species :—

Endotricha centripunctalis Gaede

E. centripunctalis Gaede, 1916 : 128. (Cameroons.) Type lost.

The type of this species, formerly in the Berlin Museum, was destroyed in the war. It has not been possible to identify this species from the description.

Endotricha wammeralis Pagenstecher

E. wammeralis Pagenstecher, 1886 : 168. (Aru.) Type not traced.

I have been unable to identify this species from the original description or to trace the type.

SPECIES DESCRIBED IN, OR SUBSEQUENTLY PLACED IN, *ENDOTRICHA*, WHICH HAVE BEEN TRANSFERRED TO OTHER GENERA

(* Type examined)

E. annuligera Butler, 1886 : 427.* This is a junior synonym of *Lamprosema mesochlora* Meyrick (Pyraustinae), see Hampson, 1898 : 695.

E. bicoloralis Leech, 1889 : 65.* This is in the genus *Stemmatophora* Guenée (Pyralini), see Hampson, 1896 : 515.

E. heliopa Meyrick, 1884 : 78.* This is a synonym of *Endosimilis stilbealis* Walk., see Whalley, 1961 : 734.

E. julialis Walker, 1859, 17 : 389.* This is a junior synonym of *Hapalia bicoloralis* Guenée (Pyraustinae), see Hampson, 1899 : 245.

E. pulchrinalis Guenée, 1854 : 220. This is in the genus *Persicoptera* Meyrick (Endotrichini), see Hampson, 1896*b* : 487.

E. pulverealis Hampson, 1916 : 363.* This is in the genus *Bostra* Walker (Pyralini), see Meyrick, 1884 : 283.

E. pyrocaustalis Lower, 1903 : 60. This is a junior synonym of *Endosimilis stilbealis* Walker (Endotrichini), see Whalley, 1961 : 734.

E. rhodophilalis Walker, 1865, 34 : 1311.* This is a junior synonym of *Hyalobathra filialis* Guenée (Pyraustinae), see Hampson, 1899 : 189.

E. ruficosta Wileman, 1917 : 175.* This is a junior synonym of *Herculia nanalis* Wileman (Pyralini), see Shibuya, 1928 : 22.

E. stenialis Warren, 1891 : 69.* This is a junior synonym of *Nymphula titanalis* Walker (Hydrocampini), see Hampson, 1897 : 144.

E. stilbealis (Walker), 1859 : 913.* This was transferred to the genus *Endosimilis* Whalley (Endotrichini), see Whalley, 1961 : 734.

E. subulalis Guenée, 1854 : 221. This is in the genus *Nacoleia* Walker (Pyraustinae), see Hampson, 1898 : 694.

E. venustalis (Warren), 1896*b* : 464.* This is a junior synonym of *Trichophysetis rufoterminalis* Christoph (Pyraustinae). This species was originally described in the genus *Cangetta* Moore, but was transferred to the genus *Endotricha* Zeller by Hampson, 1896*b* : 485.

SPECIES DESCRIBED IN *ENDOTRICHA* WHICH ARE TRANSFERRED TO OTHER GENERA IN THIS WORK

(* type or paratypes examined, type locality in brackets after reference)

E. aglaopa Meyrick, 1887 : 196. (Australia.) This species is transferred to the genus *Persicoptera* Meyrick (**comb. n.**), Endotrichini. I have seen one specimen, probably this species, from the South Australian Museum. The type appears to have been lost.

E. baryptera Lower, 1905 : 180.* (Australia.) This is transferred to the genus *Persicoptera* Meyrick (**comb. n.**), Endotrichini.

E. caustopa Turner, 1905 : 58.* (Australia.) This is transferred to the genus *Gauna* Walker (**comb. n.**), Endotrichini.

E. chagosalis Fletcher, 1910 : 295.* (Chagos Archipelago.) This is transferred to the genus *Sufetula* Walker (**comb. n.**), Pyraustinae.

E. chromatis Caradja, 1925 : 317. (China.) This is a junior synonym of *E. orthotis* Meyrick (**syn. n.**) and should be transferred to the genus *Scenedra* Meyrick (**comb. n.**), Endotrichini. (Syntypic material examined).

E. compsopa Meyrick, 1887 : 195.* (Australia.) This is transferred to the genus *Persicoptera* Meyrick (**comb. n.**), Endotrichini.

E. contestalis Caradja, 1925 : 316. (China.) This is transferred to the genus *Tegulifera* Saalmüller (**comb. n.**), Pyralini. I have seen a photograph of a syntype (in Bucharest) and a drawing of the female genitalia.

E. crobulus Lucas, 1891 : 305. (Australia.) I have been unable to trace the type or any specimen of this species. From the description I am placing it as a synonym of *Endosimilis stilbealis* Walker (**syn. n.**), Endotrichini.

E. cydippealis Walker, 1859, 17 : 391. (Sarawak.) I have been unable to trace the type of this species. From the description I am placing it in the genus *Cirrhochrista* Lederer (**comb. n.**), Pyraustinae.

E. desmotoma Lower, 1903 : 60.* (Australia.) I have examined a slide of the type. This species is transferred to *Persicoptera* Meyrick (**comb. n.**), Endotrichini.

E. dinosticha Turner, 1937 : 69. (Australia.) This is transferred to the genus *Persicoptera* Meyrick (**comb. n.**), Endotrichini.

E. drancesalis Walker, 1859, 19 : 961.* (Borneo.) This is transferred to the genus *Nymphula* Schrank (**comb. n.**), Hydrocampini.

E. duplicilinea Hampson, 1893 : 159.* (Ceylon.) This is transferred to the genus *Gauna* Walker (**comb. n.**), Endotrichini.

E. endotrichalis Warren, 1895 : 468.* (N. India.) This is transferred to the genus *Gauna* Walker (**comb. n.**), Endotrichini.

E. flavirubralis Hampson, 1906 : 211.* (W. Africa). This is transferred to the genus *Tegulifera* Saalmüller (**comb. n.**), Pyralini.

E. hemicneca Turner, 1911 : 123. (Australia.) This is transferred to the genus *Cangetta* Moore (**comb. n.**), Pyraustinae.

E. mediolineata Hampson, 1906 : 212.* (N. India.) The type is badly damaged. I am transferring it to the genus *Gauna* Walker (**comb. n.**), Endotrichini.

E. microphylla Turner, 1937 : 68.* (Australia). This is transferred to the genus *Gauna* Walker (**comb. n.**), Endotrichini.

E. ochrifuscalis Hampson, 1903 : 206.* (N. India). I am uncertain of the exact placing of this species. I am transferring it to the genus *Diathrausta* Lederer (**comb. n.**), Pyraustinae.

E. orthotis Meyrick, 1894 : 476.* (Sambwa.) This is transferred to the genus *Scenedra* Meyrick (**comb. n.**), Endotrichini.

E. penicillalis Christoph, 1881 : 4. (Russia.) This is transferred to the genus *Metasia* Guenée (**comb. n.**), Pyraustinae.

E. phaealis Hampson, 1906 : 210.* (New Guinea.) This is transferred to the genus *Gauna* Walker (**comb. n.**), Endotrichini.

E. psoloptera Turner, 1932 : 191. (Australia.) This is a junior synonym of *Persicoptera baryptera* Lower (p. 446) (**syn. n., comb. n.**).

E. primulina Hampson, 1916 : 362.* (West Africa.) This is transferred to the genus *Hyalobathra* Meyrick (**comb. n.**), Pyraustinae.

E. pulchella Hampson, 1916 : 366.* (Formosa.) This is transferred to the genus *Hendecasis* Hampson (**comb. n.**), Pyraustinae.

E. pygmealis Warren, 1896*a* : 204.* (N. India.) This is transferred to the genus *Trichophysetis* Meyrick (**comb. n.**), Pyraustinae.

E. pyralodes Hampson, 1916 : 367.* (W. Africa.) The exact position of this species is uncertain. I am placing it in the genus *Gauna* Walker (**comb. n.**), Endotrichini, although a new genus near *Gauna* should probably be erected for this species.

E. pyrochroa Hampson, 1916 : 357.* (New Guinea.) This is transferred to the genus *Bostra* Walker (**comb. n.**), Pyralini.

E. rufoterminalis Christoph, 1881 : 34. (Russia.) This is transferred to the genus *Trichophysetis* Meyrick (**comb. n.**), Pyraustinae.

E. scioides Turner, 1932 : 191.* (Australia.) This is transferred to the genus *Persicoptera* Meyrick (**comb. n.**), Endotrichini.

E. serratilis Snellen, 1890 : 570.* (N. India.) I am uncertain of the exact placing of this species. I am placing it in the genus *Gauna* Walker (**comb. n.**), Endotrichini.

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